

# The Chemical Age

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**NOTICES:**—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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## Food, Water and Air

A GROUP of official reports just issued serve to remind the public of the invaluable work of the chemist and chemical engineer in safeguarding the purity of our food, water, and air supplies. In the first of these fields, the annual report of the Birmingham City Analyst, Mr. H. H. Bagnall (whose previous reports as public analyst of Salford many of our readers may recall), is an admirable sample of the service done by public analysts in protecting consumers against the risk of being defrauded by deceptive labels or of positive injury by adulteration or impurities. In the city of Birmingham last year 5,455 samples were submitted for analysis, and of these 4,838 were taken under the Sale of Foods and Drugs Acts. Mr. Bagnall gives many examples of the scope that the Acts still allow for selling to the customer something rather different from what he thinks he is buying. He cites among other cases his favourite case of "Lemon Cheese," which should consist solely of butter, sugar, eggs and lemon, but which has been known to contain less clearly defined ingredients. Mr. Bagnall's extensive experience in the testing of foodstuffs has made him an active reformer, who believes the time is over-ripe for improvements and alterations in the law, and for increasing the existing powers of those who have to administer it.

## Atmospheric Pollution

The investigation of atmospheric pollution is dealt with in the Department of Scientific and Industrial Research's fourteenth report on observations in the year ended March 31, 1928 (H.M. Stationery Office, pp. 67, 3s. 6d.). This largely consists of statistical tables showing the amount of rainfall, and the quantity of soluble and insoluble matter deposited. The present report marks a change in the arrangements. The thirteenth report was the last of the series issued by the Advisory Committee on Atmospheric Pollution, which was associated with the Meteorological Office. The present is the first of the series for which the Department of Scientific and Industrial Research is responsible. From April 1, 1927, the Department has undertaken the co-ordinating of the local observations of atmospheric pollution, and for carrying out research into the nature of this pollution and the best ways of measuring it. It has undertaken this task at the request of a number of local authorities, and of certain supply undertakings and industrial concerns, who have promised to contribute at least half its cost.

The object of the investigation is to obtain exact information about the nature and extent of atmospheric pollution. Unless a considerable number of local authorities and others take part in the observations, using the standard methods and appliances, the data will be imperfect. The information obtained must be definite and sufficiently complete, if it is to be possible to fix standards of clean air. The case for the co-operation of the local authorities, on whom rest statutory duties in connection with smoke abatement and public health, is now widely recognised, but the expenditure by local authorities on taking observations would not be as productive as it might be, if arrangements were not made for continuous research and for some central organisation to supervise the taking of observations, to give advice when required, and to bring the results together into the common stock. The Department, for its own guidance in carrying out these duties, has secured the assistance of a committee of scientific men, with whose advice on scientific questions the Department acts, and it has appointed a Superintendent of Observations, whose advice may be sought by those taking local measurements of local atmospheric pollution.

The re-casting of the data on the revised lines has of necessity involved considerable delay in the publication of this report, but it is promised that the leeway shall be made up as rapidly as possible in succeeding issues. As general principles it has been decided that the report shall be such that its main features will be easily and immediately intelligible to the layman. If investigations of atmospheric pollution are to produce benefits of practical value to the community, their results must be so expressed as to be readily assimilated by the public at large, and, in particular, by busy

members of public authorities and their officials. The method of presentation again should, if possible, be such as will enable comparisons to be made between the pollution figures for the same station in different years, and also between those for different stations. This would not only provide a stimulus towards the abatement of pollution in any particular locality, but also serve as a means of detecting local causes of variation between the figures for two neighbouring stations. The measurement of atmospheric pollution is still in course of development, but search is being made for accurate recording instruments. The information now being obtained, the increased number of observations available, and the greater experience which will accrue to observers with lapse of time, cannot fail in due course to increase considerably the quantity of reliable data available.

### Water Purification Problems

Another report issued by the same Department (H.M. Stationery Office, pp. 24, 9d.) is that of the Water Pollution Research Board for the year ended June 30, 1929. The importance of preventing pollution, in the case of rivers and water supplies, is steadily increasing with the growth of population and the development of industry. A considerable amount of research is proceeding into the various problems involved, and the circulation of monthly summaries of current literature is having a distinctly educational effect on the interests in various ways and degrees affected. Apart from the older difficulties caused by effluents from the distillation of ammoniacal liquor, the sugar-beet factories have produced a new phase of the problem. The desirability of re-using the water in these works to the fullest possible extent has already been pointed out, and less drastic treatment is needed to render waste waters fit for re-use than for discharge into a stream. Suggestions in this direction have been adopted at several factories with considerable success. The results obtained by biological filtration are described as distinctly promising. The base-exchange or zeolite process of water softening has attracted considerable attention, and the Department expresses its indebtedness to manufacturers of base-exchange plant and materials and to others with experience in the operation of the process for information freely given. So far there is little knowledge of the mechanism of base-exchange from the physico-chemical point of view, and the matter is still under investigation by the Chemical Research Laboratory at Teddington. Sir A. Houston has also conducted experiments designed to ascertain whether there is any change in the bacterial population of water as a result of treatment by the base-exchange process.

### The Bitten Line

VISITORS to a well-known club popular among the chemical fraternity will have noticed the recent significant changes on its walls. Gone elsewhere are the portraits in photograph of its celebrities, vanished also have those representations of former gargantuan feasts, where the faces of the diners vie in pallor with their dress shirts, to be replaced by choice examples of the bitten line or the graver's needle. The earnest

students of surface tension and absorption meet there now under new influences. Some may wonder, perchance, how the artist can attain so much freedom and expression merely by letting weak nitric acid act on copper for varying lengths of time; more probably, many will think with the artist that chemistry plays no part in painting. Here they are definitely wrong: the mere mention of the name of Professor A. P. Laurie will convince those who have read his frequent letters to *The Times* on pigments and cognate matters what the chemist can do to help the artist. Dr. Alexander Scott, too, has shown a hundred ways of cleaning and renovating the old and precious; and where would the printer of engravings be without the steel facing that the electrochemist has shown him how to apply to the surface of the copper plate? So with clear conscience our chemists can affirm they have done something to deserve their mural treasures.

Those of our profession who tried to understand the recent exhibition of Italian art valued it most for the way in which the Primitives revealed the purpose of the artist, his search for methods, his experiments in the expression of form, perspective, solidity, colour. The attempt to introduce nature; the countryside; the passage from the representation of religion to things secular; the development from the Madonna to the Courtesan: all these formed an object lesson in the application of thought, in the striving for perfection. Modern art is again experimenting in its own way; most of it is but tentative, a failure; its value lies chiefly in the consequence it may have on concurrent thought, which in turn must be the primary influence on expressive art. No chemist who is striving for self-expression and realism can stand aside from the contemporary movements in art and literature without sinking to a mere shaker of test tubes, a machine. He must surround himself by the outward symbols of the movement, read books, study pictures, feel in his blood the influence of the vibrating, bitten line.

### Books Received

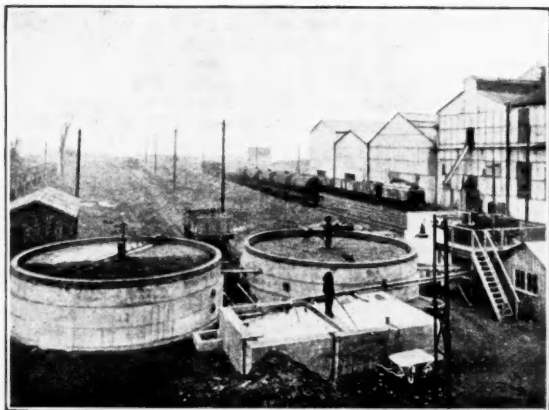
REPORT OF THE BIRMINGHAM CITY ANALYST FOR THE YEAR 1929. Birmingham: 44, Broad Street.

PAINT, POWDER AND PATCHES. By H. Stanley Redgrove and Gilbert A. Foan. London: William Heinemann. Pp. 164. 7s. 6d.

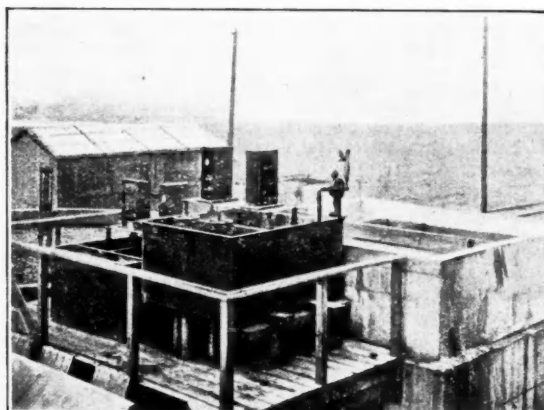
### The Calendar

June			
3	Mineralogical Society. General Meeting. 5.30 p.m.	London.	
3, 4 & 5	Society of Glass Technology. Joint Meeting with the Deutsche Glas-technische Gesellschaft.	London.	
4	Faraday Society: "Quantitative and Qualitative Analysis by X-Rays." Professor T. H. Laby. "The Determination of Potassium in Soil Samples by the Application of an X-Ray Method." J. T. Calvert. 5.30 p.m.	King's College, London.	
4 & 5	Physical and Optical Societies: Joint Discussion on Photo-Electric Cells.	South Kensington, London.	
5	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.	
19	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.	
27	National Physical Laboratory: Visit of Inspection. 3 to 6 p.m.	Teddington.	

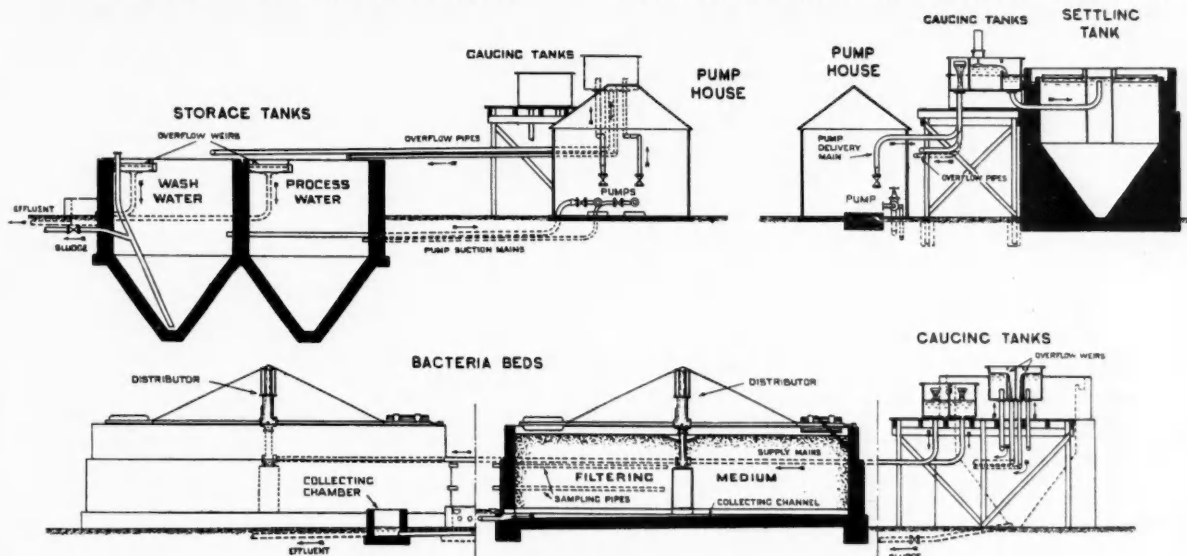
# Experimental Beet Sugar Purification Plant at Colwick



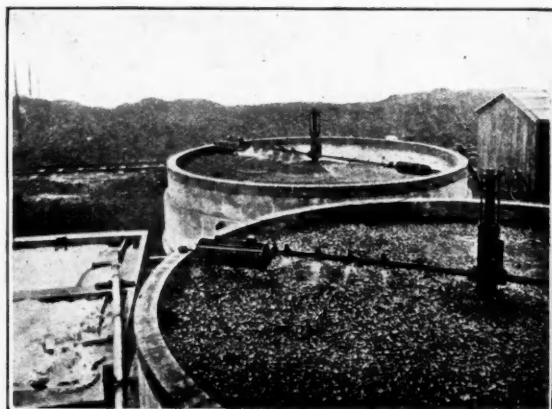
PERCOLATING FILTERS AND STORAGE TANKS.



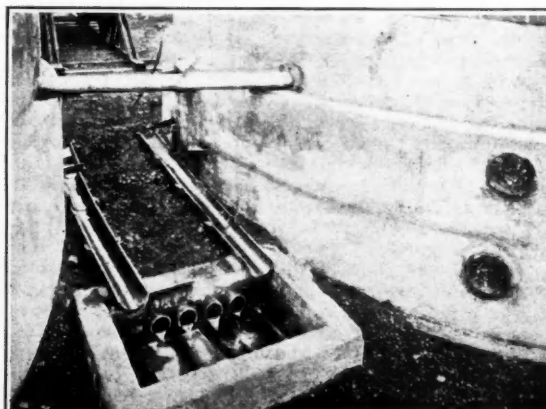
FLOW GAUGE TANKS, SEDIMENTATION TANK AND LABORATORY.



SECTIONAL VIEWS OF THE PLANT



DISTRIBUTION ON PERCOLATING FILTERS.



OUTLETS AND SAMPLING CHAMBER FOR PURIFIED EFFLUENTS.

*A description of the experiments at Colwick Beet Sugar Factory appears on page 513.*



# Chemical Industry in Overseas Markets

## Advance in Canadian Production

With the exception of two war years, when production was artificially stimulated, Canadian chemical trade last year attained its record volume. The detailed tables given below show that a steady increase has occurred in almost every section.

CHEMICAL production in Canada during 1929 showed a gain of 14 per cent. over the total for the preceding year, according to preliminary figures prepared in the mining, metallurgical and chemical branch of the Dominion Bureau of Statistics at Ottawa. At \$168,598,892, the output value of chemicals and allied products made in Canada reached a higher valuation than in any previous year except 1917 and 1918 when the production of munitions carried the output value to an abnormally high level. The advance in value in 1929 over 1928 was \$21,623,055.

Imports of chemical products were valued at \$40,131,178 as against \$36,963,694 in the preceding year, and exports rose to \$21,827,696, as compared with \$18,356,645 in 1928. Canada's consumption of chemicals and allied products during 1929, computed as the sum of the production and import values less the value of chemicals exported, was \$186,902,374, or \$21.3 millions above the corresponding total of \$165,582,886 for the preceding year.

For statistical purposes the producers of chemicals and allied products have been arranged in fifteen groups, namely: acids, alkalis and salts; adhesives; coal tar distillation; compressed gases; explosives, ammunition and fireworks; fertilisers; flavouring extracts; matches; medicinal, pharmaceutical and toilet preparations; paints; pigments and varnishes; polishes and dressings; soaps and washing compounds; wood distillation products; and a miscellaneous group of industries whose products do not naturally fall under any of the preceding headings. In 1929 gains were recorded in 12 of these 15 main divisions; the exceptions, each showing only a slightly lower total than in 1928, were the coal tar distillation industry, the manufacture of explosives, ammunition and fireworks, and the group engaged in the preparation of polishes and dressings.

### A General Increase

In the 549 plants classified as manufacturers of chemicals and related products, the capital employed totalled \$172,374,686, or \$23.4 millions more than the sum reported by the 572 concerns in this class in 1928. Employees numbered 16,791, or just a few more than in the preceding year; salaries and wages paid amounted to \$22,580,117 as against \$20,290,417. Materials used in manufacturing cost \$81,326,159, and as the selling value of products reached \$168,598,892, the value added by manufacturing, the difference between these two items, was \$87,272,733. Comparative data for 1928 showed materials at \$74,163,334, products at \$146,975,837, and value added, \$72,812,503.

Ontario and Quebec are the leading provinces in the chemical industry in Canada. In 1929 Ontario plants in this group numbered 292; Quebec stood second with 159; the numbers in the other provinces were: British Columbia, 38; Manitoba, 31; Nova Scotia, 12; New Brunswick, 8; Alberta, 6; and Saskatchewan, 3; making 549 in all. Imports from the United Kingdom were worth \$5,502,453, a gain of \$728,274; imports from the United States were valued at \$27,403,857, marking a gain of \$2 millions over the figures for 1928. Exports to the United Kingdom were valued at \$4,729,616, as against \$4,348,490 in 1928 and shipments to the United States reached a value of \$11,985,642 as against \$9,378,994 in the preceding year.

Chemical process industries are well established in Canada and contribute largely to domestic production and export trade. The record of recent years indicates active growth; higher output values show that the industries are expanding and gaining strength. It is interesting to observe that 79 per cent. of Canada's chemical needs are met by Canadian industries.

### Sulphuric Acid

According to a statement just issued, production of 66 degrees Be sulphuric acid in Canada in 1929 totalled 110,749 tons, valued at \$1,375,599 at the works, as compared with 96,227 tons worth \$1,077,836 in 1928. Exports of sulphuric acid from Canada amounted to 8,397 tons worth

\$91,634 in 1929, as against 13,329 tons worth \$152,544 in the previous year; practically all of the acid was shipped to the United States. Imports totalled only 111 tons worth \$10,287 in 1929 and 55 tons at \$8,652 in 1928. Only 7 plants in Canada made sulphuric acid in 1929. These concerns used 10,461 tons of pyrites and 25,978 tons of sulphur, while two made sulphuric acid from waste smelter gases.

### Production Figures

The following are statistics relating to the production of chemicals and allied products in Canada during the five years 1925-1929:-

Year	No. of plants	Salaries and wages \$	Cost of materials at works \$	Selling value of products at works \$	Value added by manufacturing \$
COAL TAR DISTILLATION.					
1925	9	235,558	1,305,314	2,502,629	1,137,315
1926	9	219,292	1,811,543	2,907,281	1,155,738
1927	10	258,178	2,280,134	3,616,532	1,330,398
1928	10	324,935	2,657,572	4,190,823	1,533,231
1929	10	320,350	2,674,535	4,006,797	1,334,262
ACIDS, ALKALIS AND SALTS.					
1925	20	2,992,695	12,472,687	25,396,782	12,924,095
1926	19	3,075,649	12,924,539	27,809,836	14,885,297
1927	16	2,858,644	15,110,691	28,115,148	13,004,137
1928	16	3,490,469	23,925,404	39,190,962	16,265,558
1929	17	4,635,703	31,474,555	57,422,178	25,947,023
COMPRESSED GASES.					
1925	20	481,595	370,569	2,086,613	1,716,044
1926	24	521,824	435,729	2,422,486	1,986,757
1927	25	604,417	550,795	2,625,698	2,074,903
1928	25	652,893	479,587	3,145,884	2,666,297
1929	25	757,405	751,897	3,800,901	3,049,004
EXPLOSIVES, AMMUNITION AND FIREWORKS.					
1925	11	1,758,358	5,796,189	10,258,515	4,462,026
1926	12	1,719,671	5,757,682	10,211,425	4,453,743
1927	13	1,363,750	5,906,010	11,046,372	5,140,362
1928	11	1,470,626	5,884,767	12,185,034	6,300,267
1929	9	1,576,346	3,886,992	10,710,934	6,823,942
MEDICINAL, PHARMACEUTICAL AND TOILET PREPARATIONS.					
1925	151	3,411,676	5,942,361	17,307,977	11,365,616
1926	176	3,471,266	6,956,098	19,607,985	12,651,887
1927	184	3,785,724	7,259,718	20,714,544	13,454,826
1928	184	4,002,876	7,202,018	21,842,442	14,640,624
1929	179	4,358,668	7,541,814	21,884,020	14,342,206
PAINTS, PIGMENTS AND VARNISHES.					
1925	62	3,093,191	12,613,995	22,234,268	9,620,273
1926	64	3,375,961	13,105,307	24,803,237	11,697,870
1927	62	3,552,586	12,934,939	25,229,454	12,294,815
1928	68	3,967,295	14,489,934	27,868,040	13,378,112
1929	70	4,187,095	13,578,337	29,564,592	15,986,255
SOAPS AND WASHING COMPOUNDS.					
1925	57	2,099,806	8,949,502	14,068,378	5,118,878
1926	62	1,993,871	9,556,596	14,847,018	5,290,422
1927	63	2,036,783	9,890,020	15,228,100	5,638,080
1928	71	2,160,696	10,790,307	16,998,726	6,808,419
1929	65	2,299,784	10,623,113	18,443,475	7,820,395
WOOD DISTILLATION.					
1925	9	234,990	846,287	1,970,430	1,124,143
1926	8	211,388	826,125	1,712,169	886,044
1927	10	271,088	863,717	1,571,176	707,459
1928	6	241,363	824,322	1,030,069	806,287
1929	6	264,228	905,398	1,901,665	596,267
ADHESIVES.					
1925	16	282,012	660,762	1,443,356	782,654
1926	15	328,597	866,464	1,710,095	843,631
1927	14	357,034	921,301	1,934,240	1,013,108
1928	14	345,152	984,301	1,956,865	972,564
1929	13	340,698	1,125,073	2,052,339	927,266
INKS.					
1925	22	591,303	839,598	2,315,232	1,475,634
1926	20	628,418	944,561	2,436,057	1,491,496
1927	24	682,777	1,082,983	2,830,225	1,747,242
1928	22	721,458	1,069,237	2,917,603	1,848,366
1929	22	772,816	1,095,810	3,036,107	1,940,297
MATCHES.					
1925	4	563,691	1,052,432	2,054,640	1,002,208
1926	3	523,784	1,069,635	1,943,795	874,160
1927	3	503,102	905,845	1,874,707	908,862
1928					
1929					
FERTILISERS.					
1925	13	205,173	1,045,294	1,437,787	392,493
1926	12	210,427	1,047,541	1,449,589	401,948
1927	12	224,564	1,200,030	1,844,032	644,002
1928	12	281,109	1,446,800	2,189,986	743,186
1929	11	282,963	1,492,966	2,332,012	839,046
POLISHES AND DRESSINGS.					
1925	35	374,634	683,801	1,624,391	940,590
1926	39	308,358	662,155	1,406,581	744,426
1927	37	299,795	671,423	1,422,111	750,688
1928	33	298,733	653,788	1,396,675	742,887
1929	28	295,393	621,583	1,351,431	729,848



Year	No. of plants	Salaries and wages \$	Cost of materials at works \$	Selling value of products at works \$	Value added by manufacturing \$
FLAVOURING EXTRACTS.					
1925 ..	22	312,964	998,067	1,686,743	664,676
1926 ..	22	295,595	978,159	1,722,499	744,340
1927 ..	20	318,811	1,107,093	1,821,374	714,881
1928 ..	23	346,751	1,122,243	1,874,099	751,856
1929 ..	21	444,194	1,136,711	1,900,048	763,337
MISCELLANEOUS CHEMICAL INDUSTRIES.					
1925 ..	59	1,249,785	2,004,523	6,519,005	3,854,482
1926 ..	72	1,425,276	3,182,291	7,539,476	4,357,185
1927 ..	68	1,479,598	2,880,058	7,310,959	4,430,901
1928 ..	77	1,980,121	4,233,954	9,587,883	5,351,829
1929 ..	73	2,038,474	4,419,375	10,192,390	5,773,015
TOTAL CHEMICALS AND ALLIED PRODUCTS.					
1925 ..	510	17,887,437	56,299,219	112,906,746	59,607,527
1926 ..	550	18,309,377	60,124,582	122,589,526	62,164,914
1927 ..	561	18,956,851	63,630,588	127,484,672	63,854,084
1928 ..	572	20,290,417	71,103,334	140,975,837	72,812,503
1929 ..	549	22,580,117	81,326,159	168,598,892	87,272,733

## A South African Market

### Trade in Paints and Varnishes

THE official figures for South African trade in paints and varnishes last year have yet to be published, but, as far as can be discovered, they were very much in excess of those for 1928, and will almost certainly be found to have established a record for the trade.

For the Union and Rhodesia there was an increase of roughly £90,000 in the value of the paints, pigments and colours imported; an increase of about £8,000 in varnishes and about £6,500 in turpentine and substitutes. Imports of vegetable oils are fairly constant, the increase being only about £2,000. The sole item in which trade tended to fall off was polishes and blacking. Here the decrease totalled nearly £60,000 due, however, not to any slackening of demand for British blacking and polish, but to the over-trading in the previous year. In 1928 the Union and Rhodesia imported blacking and polish to a total value of £236,550. Rhodesia, it might be mentioned, is responsible for a very small portion of the paint and varnish imports, rarely rising above £50,000 per annum.

### Home Manufacture

South Africa has begun seriously to satisfy some of the local paint and varnish needs by manufacturing on her own account. The modern paint factory at Umbogintwini, Natal, is but one of many such establishments, but, in spite of all this activity, the local demand for imported oilman's stores has obviously not tended to decrease. The South African building trade is booming. In almost every town and village large schemes are being embarked upon, plans often requiring the expenditure of several hundred thousand pounds in building materials.

Part of the demand for varnishes, paints, oils and similar goods is supplied by local manufacturers, but such competition cannot greatly influence imports, for these are largely composed of high grade goods at present far beyond the skill of South African makers. There have been times in the past when sales of such imported goods have tended to decrease, but, on the whole, the market has an upward tendency, and British exporters, by studying local needs, increased advertising and experienced representation, are likely to get larger returns here.

Some of the fluctuations of the trade are shown in the returns for all imports during 1926, 1927 and 1928. The figures were respectively: £473,158; £446,137; and £382,000. The oil trade had a value of £3,093,203 in 1926, but the following year this dropped to £2,630,187, with, in 1928, a rise in value to £2,866,000. Other oilman's stores, excluding candles and soap, to a value of about £350,000, are imported annually. These imports cover most grades of paint. The South African buyer, however, looks to his own country for cheap paints and varnishes, and insists upon having the British-made article when he requires an expensive but durable substance.

### Needs of Gold Mining Industry

The gold mining industry is a large importer of oilman's stores. In 1926 the Rand mines bought greases and tallow worth £99,873 from overseas, but the next year these purchases were worth £103,524. Purchases of paints, tar and driers rose from £32,386 in 1926 to £34,841 in 1927. Mining needs of this sort must increase steadily and are well worth watching by enterprising manufacturers.

Varnishes show a tendency to increase in value. A comparison of the imports for the first nine months of 1927 and 1928 reveals that £36,604 was spent thus in the first period and £41,459 in the second. Over the same periods the increase in sales of imported polishes was from £138,958 to £167,609, and for vegetable oils from £183,813 to £216,735. The turpentine and substitute imports decreased in value from £27,794 to £26,221.

Such products of well-known brands are sure of a steady sale in the Union. In fact, trade in these is on the increase. Competition is keen, but persistent sales efforts on the part of the representatives of British manufacturers have been well rewarded. Obviously, most success falls to manufacturers who have studied the market, but, on the whole, South African demands are no more specialised than those of other countries. Paints are required to resist the effects of a strong sun rather than of copious rains, but in different parts both types of paint are needed, especially a few brands to resist constant exposure to water.

The United Kingdom has a large portion of South Africa's trade in oilman's stores, this in 1927 being valued at £782,312, an advance of over £46,000 on the previous year's figures. Tallow and substitutes worth £109,231 were imported from Australia in 1927, and in the same year paints and painters' goods worth £103,657 were derived from the United States. This trade represented a decrease of nearly £5,000 on the previous year's imports from this source. In 1925 South Africa imported British varnishes, stains, lacquers and so on to a value of £29,413, but now this trade has an annual value of over £37,000, and is likely to make further advances in the near future.

Paints and colours ready mixed for use, artists' colours, enamels, water-paints, distempers, colour-washes, flat oil paints, sheep-marking oils and petrifying liquids, it might be noted, are subject to an *ad valorem* duty of 25 per cent. This duty on dry pigments, patent driers and colours ground in oil, not including white lead, is 20 per cent.

## Chemicals in British Malaya

### Openings for British Products

THE importation of chemicals and chemical preparations into British Malaya amounts to roughly one and three quarters million pounds per annum, and the market is therefore of sufficient importance to engage the closest attention of United Kingdom firms. The share of the business at present held by British manufacturers is by no means as large as might be expected, and, although the position has improved during recent years, opportunities undoubtedly exist in numerous directions for further substantial progress to be made.

There is a heavy call for acetic acid, imports averaging about £90,000 per annum, and emanating chiefly from Holland, Germany and Italy. The market for sulphuric acid is also of some importance, the average yearly importation being in the neighbourhood of £12,500. Japan controls the bulk of this business, a fact generally ascribed to the low prices quoted. With regard to other acids, Continental countries, particularly Germany and Holland, are increasing their trade at the expense of Great Britain, and United Kingdom firms must reduce their prices to a keener level if this competition is to be more effectively met. The available trade is worth about £24,000 annually.

### Increasing Demand for Disinfectants

The demand for disinfectants is increasing, and this business is almost entirely in British hands. Soda and sodium compounds, which are in good request, are also principally obtained from the United Kingdom. It should be noted, however, that British trade has latterly decreased to the benefit of Belgium, France and the U.S.A. Imports from all sources are valued at roughly £37,000 per annum.

Purchases of other chemical products reach an average yearly value of £240,000, of which approximately one-third is supplied by United Kingdom firms. British exports are increasing, however, and future prospects generally appear to be promising.

About 40 per cent. of the demand for drugs and medicines is satisfied by British manufacturers, and little difficulty should be experienced in securing a larger share of this business. The position with regard to dyes is much less encouraging, only 11 per cent. of the trade being supplied by Great Britain.

Germany and Holland satisfy the bulk of the demand, and imports from the former country are increasing.

A very valuable trade is done in paints, varnishes and enamels imports being valued at some £270,000 per annum. Owing to the very efficient handling of British interests in this direction and the high competitive ability of United Kingdom products, no less than 90 per cent. of the trade is controlled by Great Britain. The position with regard to blacking and polishes is also satisfactory, 75 per cent. of imports, which amount to £28,000 annually, being in British hands. Australia has recently secured a footing in the market, however, while America has also succeeded in increasing her trade.

#### Keen Competition in Soaps

Competition for the business in toilet soaps is very keen, and supplies are obtained from Great Britain, Germany, France, Japan, China and the U.S.A. British manufacturers are well represented in the market and have captured over 50 per cent. of the trade, but this should be readily increased if sufficient endeavour is made.

The local manufacture of other soaps is increasing and, while the output from domestic concerns does not yet seriously affect imports, the position requires careful watching. As in the case of toilet soaps, British manufacturers control the bulk of the trade, the only serious competition in this instance emanating from Australia. Imports of toilet soap amount to £63,000 and other soaps to £290,000 per annum.

The better qualities of perfumes and cosmetics are supplied by the United Kingdom and France, whilst Germany controls the trade in the cheaper grades. Competition from both these countries is becoming keener, and German firms in particular are making strenuous efforts to increase their trade. The business is worth over £300,000 per annum, and is therefore sufficiently large to warrant close and careful cultivation.

Future prospects in British Malaya are undoubtedly promising, and no effort should be spared by United Kingdom firms to strengthen their present connections in the market. The employment of competent local representations should greatly assist this object, while the adoption of more aggressive sales methods might generally be undertaken with advantage.

### United States Chemical Trade

#### Big Step Forward in 1929

THE U.S. chemical industry is gaining a firm foothold in the world's markets, according to the American Chemical Society's annual analysis, which shows that an adverse balance of trade of nearly \$6,000,000 in 1928 has been changed to a favourable balance of \$8,000,000 in 1929. "The significant feature of the returns," according to this analysis, "lies in the fact that the gain of \$15,000,000 in the export trade was due, not to the swelling of a few outstanding items, but to increases in nearly all the large groups of chemicals. In the import trade, on the other hand, a gain of \$6,000,000 in industrial chemicals was balanced by a like decrease in fertilisers, with the other groups showing no very wide fluctuations."

Imports in 1929 were \$144,062,000, and exports \$152,162,000. Pigments, paints and varnishes lead in exports of chemicals and related products with a total of \$29,119,000. Industrial chemicals were second with \$28,194,000, medicinals and pharmaceuticals third with \$21,282,000, and fertilisers and materials fourth with \$20,444,000. Export totals of other groups were: Coal tar products, \$18,059,000; soap and toilet preparations, \$16,059,000; industrial chemical specialities, \$14,457,000; explosives, fuses, etc., \$4,549,000.

Imports of coal tar products fell off somewhat in 1929, while exports registered a large gain. But the lower total of the incoming trade was due almost wholly to the drop in a single item, creosote oil. Other crudes and intermediates in general showed substantial increases, while imports of finished coal tar derivatives were more than 20 per cent. higher than in 1928. Exports of coal tar products showed a gain of nearly 30 per cent. in value, the total rising from \$14,113,000 in 1928 to \$18,059,000 last year, very largely due to increased sales of a single article, benzene, exports of which went to 33,346,000 gallons valued at \$8,537,000, as compared with 21,338,000 gallons valued at \$4,963,000 in 1928.

Of the industrial chemical specialities manufactured in the United States much the largest quantities are sent to North and South America. The biggest item is household disinfectants, insecticides, deodorants, etc., of which 10,262,000 lb. of liquid and 721,000 lb. of paste or powdered preparations were sold in 1929.

As in past years the leading commodity among the imports of industrial chemicals was sodium cyanide, trade in which showed a 6 per cent. gain in 1929 in point of quantity, while the value increased still more, rising from \$2,930,000 in 1928 to \$3,199,000 in 1929. Canada, as usual, supplied about three-fourths of the total. Second to sodium cyanide in point of value was crude iodine, imports of which reached a total of \$2,249,000. This was a drop of about 8 per cent., and marked a continuation of the downward tendency noted in the year before.

Imports of alcohols were chiefly methanol from Germany, but exports, while lower in quantity, showed a considerable increase in total value. More than three-fourths of this trade went to three countries—the United Kingdom taking 216,000 gallons, Japan 95,000 gallons and Cuba 80,000 gallons. A decrease of nearly \$6,000,000 in imports of fertilisers and materials in 1929 was due very largely to a big drop in ammonium sulphate-nitrate, and to a decline in Chilean nitrate shipments. Exports of fertilisers, on the other hand, returned large increases, bringing the total tonnage of the year up to 1,535,000, as compared with 1,219,000 in 1928, and the total value to \$20,444,000, as compared with \$16,095,000.

#### Increased Petroleum Exports

Smokeless powder exports, 949,000 lb., having a value of \$853,000, were only about one-half as large as those of the previous year. Exports of petroleum and petroleum products took a big stride forward as regards value, total returns being \$561,178,000 as against \$525,853,000 in 1928. The gain, however, was due largely to higher prices for refined oils, the volume of which was only slightly higher than in 1928. Crude petroleum exports registered a large increase both in amount and in value.

Exports of lump sulphur amounted to 855,542 tons, valued at \$17,649,000, as compared with 685,051 tons, value at \$14,345,000 in 1928. The principal buyers were Canada, Germany, France and Australia, in that order. These four countries took nearly three-fourths of the total. Shellac, the largest item among the imports of varnish gums, reached a total of 33,335,000 lb., valued at \$12,789,000, as against 24,056,000 lb. valued at \$10,210,000 in 1928. Exports of naval stores, gums and resins rose from a value of \$26,433,000 in 1928 to \$30,998,000 in 1929.

The American Chemical Society's analysis, based upon Government figures, says that the past year was one of "steady, prosperous activity in American chemical industries."

### Competition in Overseas Markets

#### Effects of the War

THE growth of foreign competition met with in overseas markets forms an important section of the interim report of the committee appointed by the Board of Trade on Education for Salesmanship.

An important factor to remember, states the report, is that the war increased the desire, and sometimes the capacity, of a number of countries to become, as far as possible, economically independent. The general position, therefore, is that the non-combatants, not merely in Europe, but throughout the civilised world, have had the opportunity and the incentive to increase their productive power, and that certain of the combatants were forced to do so apart from the manufacture of munitions. It is idle to suppose that this development will not, on the whole, be maintained.

Account has also to be taken of growing national consciousness, spontaneous no doubt in origin, but also actively fostered. The increase in French manufacturing strength since the war is well known, and the tendency of the average French customer is to buy French, not foreign, goods. The pressure of foreign competition, which was already being felt before the war, has been greatly accentuated by these facts and by others, notably by the rapidly growing productive power of the United States of America, which is only in part due to conditions created by the War. But though competitors may be most

numerous and most highly organised in Europe, sufficiently acute competition is experienced in almost every country, as mentioned with considerable emphasis by all witnesses, whether in the British Empire overseas, or in foreign countries, notably in Latin South America. A passage in the Report for 1927-28 of H.M. Senior Trade Commissioner in India (one of the witnesses) states: "The outstanding features of the year have been intensified American competition in machinery, motor cars, rubber tyres, fents and electrical apparatus; increased shipments from Germany of dyes, chemicals, hardware, machinery, artificial silk and woollen piece-goods; an advance of nearly 2 crores in the value of the imports of grey, white and coloured piece-goods from Japan, larger purchases of Italian artificial silk yarn and piece-goods, woollens and coloured woven and dyed cotton goods; and a continuance of severe Belgian competition in iron and steel and railway material."

No doubt the question of price would have become increasingly prominent even if there had been no war; but, as it is, the intensified competition of the last few years, combined with the low purchasing power of many countries, has made it one of importance. The Association of British Chambers of Commerce says in its evidence that more attention might be paid to the fact that under conditions of modern competition price must often prove a deciding factor and that, generally speaking, superior quality will not command much excess price in competition. Another consideration of a very general character, and more immediately related to the main line of inquiry, is the necessity for co-operative marketing.

## British Chamber of Commerce Congress

### Lord Melchett on Empire Unity

LORD MELCHETT, Chairman of Imperial Chemical Industries, was among the speakers on the first day of the twelfth Congress of the Federation of Chambers of Commerce of the British Empire, which was opened by the Prince of Wales on Monday and was attended by 300 delegates from 158 Chambers in all parts of the Empire. The Congress, said Lord Melchett, was meeting at a very important and critical moment in the history of the Empire's trade. All parts of the Empire were involved in the cycle of economic depression. The solution could lie only in reorganising our great export trade. Great Britain was over-industrialised, under-agriculturalised, overpopulated for its size, dependent for food and raw materials on the outside world, finding doors more and more difficult to enter and tariff walls more difficult to climb. We must either diminish our population or find room for expansion in those vast territories of the Empire which could be successfully developed.

"It is essential," said Lord Melchett, "that we should endeavour, regardless of party and previous ideas, to see that we exchange our commodities freely among ourselves to the best advantage of all. Let the family come first and outsiders next. A lot of people say to me, 'When you bind the Empire together, won't you antagonise other nations?' I never have found other nations bother themselves a hoot whether they were antagonising us."

Lord Melchett added that unless economic unity was secured within the Empire there was a danger that this mighty Commonwealth of free peoples might fall to pieces as other empires had done.

### Seeking Outlets for Production

The Earl of Iveagh, who is president of the Congress, said since the last congress, held in Capetown in 1927, the worldwide setback in trade and industry, which was even then becoming apparent, had increased in severity. To-day almost every civilised country was anxiously seeking outlets for its productions—in other words, employment for the workers. The British Empire, which accounted for 30 per cent. of the total trade of the world, had naturally experienced its share in the general misfortune.

"I am of opinion," Lord Iveagh said, "that we have it in our power, so far as the Empire is concerned, to remedy the existing state of affairs. The latest available figures, those for the year 1927, show that the total value of imports into the Empire from foreign countries was £1,380,000,000, while that of imports from Empire countries was £862,000,000. The total export trade of the British Empire with foreign countries was £892,000,000, while exports to countries within

the Empire were valued at £784,000,000, so you will see that the Empire bought from foreign countries half as much again as it sold to them."

This problem was not one which affects the United Kingdom alone. Each separate economic unit of the Empire might find itself in such a position as the small business when it stands in the path of the big combine. As an economic unit the British Empire would have within its borders a population three and a half times as great as that of the United States and one and a half times as great as Europe without Russia. It must, however, be recognised that the rationalisation of industries between nations, as between private concerns, involved immediate sacrifice for ultimate gain. Such sacrifices business men were accustomed to face with faith and courage.

### Bills of Lading

Sir Stephen Demetriadi moved a resolution on the subject of bills of lading. This noted with satisfaction the progress made in the direction of uniformity in the Empire of rules for the carriage of goods by sea, and urged those Dominions, Colonies, and Protectorates which had not so far adopted legislation similar to the British Act to take steps to that end at the earliest possible date.

Emphasising the salutary effect which uniformity within the Empire would have upon the attitude of foreign nations, Sir Stephen said that the Empire controlled about 37 per cent. of the world's tonnage. It was desirable that in all essential Empire legislation should not deviate from that which Great Britain, Australia and India had adopted and applied with such marked success.

The resolution was carried unanimously.

## Indian Chemical Notes

[By OUR INDIAN CORRESPONDENT.]

### Trade in 1929

IN spite of general depression in trade in 1929, the imports of chemicals into India during the year amounted in value to Rs. 267 lakhs, as against Rs. 258 lakhs in the previous year. The imports of acids rose from 22,000 cwts. to 28,000 cwts., of which acetic acid amounted to 3,000 cwts., oxalic acid 2,000 cwts., and sulphuric acid 8,000 cwts. This last has shown considerable improvement, as the imports in 1928 amounted to 6,000 cwts. The imports of aluminous sulphates, of ammonia and its salts, of arsenic and its oxides, have all shown increases, but bleaching powder declined from 100,000 to 92,000 cwts. Carbide of calcium increased from 44,000 to 59,000 cwts. and copper sulphate from 17,000 to 26,000 cwts. The imports of disinfectants fell from 37,000 to 34,000 cwts.

### Soda Compounds, etc.

Under soda compounds, imports of sodium bicarbonate rose from 108,000 to 119,000 cwts., caustic soda from 177,000 to 185,000 cwts., sodium carbonate from 1,148,000 to 1,155,000 cwts., and sodium sulphide from 39,000 to 43,000 cwts. On the other hand, sodium borax declined from 21,000 to 19,000 cwts., sodium cyanide from 11,000 to 10,000 cwts. and other sorts from 33,000 to 24,000 cwts. Of magnesium compounds magnesium chloride increased from 26,000 to 37,000 cwts and magnesium sulphate from 43,000 to 44,000 cwts. Potassium compounds showed a slight increase, but lead compounds declined. Zinc compounds rose from 19,000 to 24,000 cwts. The imports of sulphur rose from 344,000 to 384,000 cwts. Other sorts of chemicals were valued at Rs. 49 lakhs against 47 lakhs in the previous year. The imports of china clay, which is not recorded under the head of chemicals, were valued at Rs. 14 lakhs against Rs. 6 lakhs in the previous year.

### Imports of Drugs

The total imports of drugs and medicines amounted in value to Rs. 217 lakhs against Rs. 203 lakhs in the previous year. The imports of camphor amounted to 1,790,000 lb. valued at 31 lakhs, imports mostly coming from Japan and Germany. Imports of codliver oil rose from 82,000 to 90,000 cwts., but those of quinine salts declined from 134,000 to 118,000 lb., the value, however, increasing from Rs. 23 lakhs to Rs. 25 lakhs. Saccharin also showed an increase from 25,000 lb. to 34,000 lb. The imports of proprietary medicines showed a very satis-



factory expansion, and their value increased from 40 lakhs to 47 lakhs.

#### Boycott of British Medicines

In view of the recent decision of the British Medical Council not to recognise Indian medical degrees, the medical practitioners, chemists and the public in India are called upon by the Indian Medical Council "to encourage the use of drugs and medical appliances manufactured in India and wherever such products are not available, to use those manufactured in countries other than Great Britain with a view to boycotting British products." In response to this resolution several Indian firms of wholesale druggists and chemists in Calcutta and Bombay have refused to enter into their usual contracts with British goods. It is reported from Calcutta that 21 of the importing firms in Calcutta have expressed their willingness not to indent for British goods. It is to be seen how far that attitude will be maintained in future.

#### The Trade in Manures

The rapid increase in the use of manures in India is reflected in the expanding imports, which amounted to Rs. 97 lakhs as against Rs. 67 lakhs in the previous year. Nitrate of potash rose from 6,000 tons to 7,500 tons, nitrate of soda from 8,000 to 12,000 tons, sulphate of ammonia from 14,000 to 23,000 tons, and others from 26,000 to 29,000 tons. Imports of fish manures slightly declined from 3,000 tons to 2,800 tons. It is of interest to note that the total imports of manures have more than doubled since 1927. The largest imports are in Madras, where a large trade has been developed by firms by carrying on propaganda with the assistance of the Agricultural Department.

#### Imports of Salt

Imports of salt into India during 1929 amounted to 607,000 tons, as compared with 614,000 tons in the previous year, the value amounting to 126 lakhs as against 156 lakhs in the previous year. Imports from the United Kingdom declined slightly from 76,000 tons to 72,000 tons, those from Germany from 62,000 to 60,000 tons, those from Spain from 67,000 to 54,000 tons, and those from Egypt from 112,000 tons to 104,000 tons. The imports from Aden alone showed increase—i.e., from 201,000 to 220,000 tons.

#### Paints and Painters' Materials

The imports of paints and painters' materials were valued at Rs. 146 lakhs, practically the same as in the previous year. There was considerable increase under barytes, blue paint, red lead, white lead and zinc white. Red lead increased from 33,000 to 38,000 cwts., white lead from 13,000 to 17,000 cwts., and zinc white from 300,000 cwts. to 340,000 cwts. Of the total imports amounting to 491,000 cwts. of paints, the United Kingdom's share was 265,000 cwts., a slight decline from the previous year, and Germany's share was 73,000 cwts., as against 38,000 tons in the previous year. The imports of turpentine rose from 10,000 to 12,000 tons, but those of varnish remained unchanged at 35,000 cwts.

#### Other Imports

Among other imports of importance may be mentioned cement, which declined from 126,000 tons to 121,000 tons. Imports from the United Kingdom fell from 92,000 to 80,000 cwts., while those from Japan rose from 12,000 to 17,000 cwts. Imports of asphalt rose from 16,000 to 25,000 tons. The imports of gums and resins rose from 204,000 cwts. to 210,000 cwts., value rising from 40 lakhs to 43 lakhs. Imports of lac were unusual during the year and amounted to 50 lakhs in value as against 10 lakhs in the previous year. There were unusual imports of stick and seed lac. Imports of artificial silk were valued at 411 lakhs against 538 lakhs in the previous year.

#### Lac Cultivation in Bengal

The cultivation of lac in Bengal is carried on by people who hardly possess the necessary technical knowledge for increasing the quantity and improving the quality of the present output. A committee appointed by the Registrar of Co-operative Societies, Bengal, have recommended that the Government should start a department akin to the Sericulture Department, staffed with trained officers, who will give the necessary technical instruction to cultivators with a view to increasing the output and improving the quality of their crop, as well as protecting it against extremes of temperature,

a thing that the rearers believe at present to be altogether impossible.

At present the shellac cakes produced locally are sent to Calcutta to be exported abroad. If some of the shellac cakes are made use of locally for making toys and other things of daily necessity, it will improve the material resources of the districts.

#### Examining Natural Products

A substantial section of the activities of the Indian Institute of Science, Bangalore, is concerned with the systematic examination of Indian seeds, barks and other natural products, with a view to utilising commercially the materials obtainable from them and improving the methods of isolation. During the last year, crocodile fat was investigated along with fixed oils from *Vernonia anthelmintica*, etc. Among essential oils examined are those of *Itzac zoylanica*, *codrola toona*, and cinnamon leaf. Further progress has also been made with the study of Indian foodstuffs, particularly with reference to their protein constituents. The microbiology of soils is being investigated and various problems of fermentation have been examined.

#### Manufacture of Opium

There was a considerable curtailment in the area of the opium crop in 1929 as compared with the previous year. No crude morphine was manufactured, and 119 lb. of morphia hydrochlorate was manufactured and also small quantities of codeine and crude narcotine for experimental and research purposes. In future the selection of opium of high morphine strength for medicinal purposes will be done in the factory. The opium from the special seed scheme is of better quality and more suitable for special medical opium.

#### Research at Pusa

In the research on soil acidity, some progress has been made at Pusa. For several years a study has been made by Dr. Harrison of various metallic electrodes and their applicability to the determination of pH values, the object being to obtain a robust and reliable method suitable for field work. Several electrodes such as molybdenum and tungsten, appeared to be promising, but the only one which gave uniformly concordant and reliable results over extended periods was antimony. Attention was therefore concentrated on this electrode. It was observed in the course of experiments that by merely dipping the antimony electrode into the moist soil, sharp, satisfactory and reproducible readings were obtained which gave excellent agreement with the values obtained in soil suspensions by the hydrogen electrode. Based on these observations, a simple apparatus has been designed for employment in the field. Besides being easily portable, the apparatus possesses a further advantage inasmuch as in carrying out pH determinations with its help it is not necessary to submit soil samples to manipulative processes.

#### Lime Requirements of Soils

The robustness and ease of application of the antimony electrode makes it eminently suited to the determination of the lime requirements of a soil. Equal amounts of a sample of soil are weighed out into separate beakers and to each is added distilled water containing increasing additions of lime water and the whole is well stirred and allowed to stand for half an hour. At the end of this time, the pH value of each mixture is determined and plotted against the equivalent amount of lime added. From the resulting curve it is easy to calculate the amount of lime which must be added to an acre of soil in order to obtain neutrality, or any other point of acidity or alkalinity, which may be desired.

#### Tobacco Curing

Several methods of curing tobacco have been tried. It has been definitely shown that rack curing has the effect of reducing the nicotine content, and especially that of the volatile nicotine and the experiments have further shown that of the several methods employed in curing of tobacco on racks, the one of curing in the sun but protecting the leaves from dew gives the best results in respect of colour, texture and paucity of volatile nicotine, an excess of which would produce an undesirable sharpness or pungency. It is interesting to note that the samples which have been declared by the experts as the best suitable for cigarette making, contain the least amount of nicotine, and that tobaccos as the last in the grade of cigarette making contain the most.

## Unemployment and Work

By Sir Ernest J. P. Benn

*The slowness and ineffectualness of official action for problems such as unemployment are dealt with by Sir Ernest Benn in the fifth article of his series. Previous articles appeared in THE CHEMICAL AGE of May 3, 10, 17 and 24, and the next, on "Political Poison," will appear next week.*

### V.—Official Unassistance

"SOMETHING must be done." There is a satisfaction about this phrase which explains our habit of using it on all occasions, as a study of political speeches and newspaper articles will show. Whatever the subject of the speech, the regular method is to enlarge upon the troubles and the difficulties and then the whole audience applauds when the table is thumped and the orator declares that we will no longer brook delay and that "Something must be done." The next step is to set official machinery in motion and years later we discover to our cost that the "doing" has been more in the nature of talk than action.

Those who have no practical experience of business methods find it hard to understand that official action is the slowest, most expensive and generally most inefficient of all forms of action. This is necessarily so, even when the official method is obviously the best. For instance, education is accepted as a proper sphere for government activity, but that does not alter the fact that it costs a great deal more to educate a child in a government school than by the use of any other agency. This is as it should be and is quite proper. Public money must be spent with due delay and strict regard to forms and rules which have no bearing upon private disbursements. When, however, public opinion forces government action in the field of commerce or industry, a double damage is always done. The first effect is to drive off the field all the private individuals who would ordinarily be at work upon it. They can proceed with their activities so long as they are dealing with other private individuals, all subject to the same limitations and all possessing the same prospects. When, however, the government or the local authority enters the field and begins to make bargains without the healthy influence of the risk of personal loss, others who are subject to that influence have no alternative but to leave things alone.

#### A Last Resource

The first effect, therefore, of deciding that "Something must be done" officially is always to stop somebody else doing anything. Unemployment is created from the moment that officials first put in an appearance in any market. Then, if and when that appearance is followed by real action, the pace is slower, the price is higher and the loss almost inevitable. The question is too big to discuss in this connection, but it should be remembered that official action, if wise, is always a last resource; that the public authority method is the worst and not the best way of satisfying a practical economic need. Public action half empties the private purse and closes up the other half.

In the matter of unemployment, we know that discharges are made with far less compunction since insurance was introduced than before. An employing company having paid perhaps thousands of pounds to the insurance fund thinks itself fully justified in relying on the fund to relieve it of obligations which had previously been regarded as its own. The dole is commonly supposed to encourage the spirit of idleness among the workers. I doubt very much whether that aspect is nearly so serious as the tendency, inherent in its very nature, to encourage employers to leave to the State obligations which the State in its folly has been vain enough to assume.

#### American Example

America helps us to understand this very difficult dilemma. She resolutely declines to take any official notice of unemployment, and deliberately leaves the distress created by bad trade to the care of private charity. A talk between an average American citizen and an average Englishman on this matter always discloses very wide differences in outlook. The American does not think himself a hard-hearted materialist, but he regards us as innocent fools. I have had the advantage of long and earnest conversations with unemployed in America and have talked with the lowest of the down-and-outs in East

Side New York, Pittsburg, Chicago and elsewhere. From the very bottom upwards, these men regard their difficulties as mere stepping stones to fortune. There is in America a total absence of that reliance on superior authority which is the characteristic and the curse of the post-war Englishman. It is hard to blame the victims of our way of looking at things. The fault is with the public opinion which seems to delight in creating and fostering a spirit of helplessness and hopelessness. But wherever the blame, the effect is the same—millions of people whose desire to be up and doing is discouraged by the suggestion that the real responsibility is with others.

The Labour Exchange is a dangerous drug, undermining the vitality of both employers and employed. It has failed to promote employment; the theory of mobility upon which it was founded has disappeared; the principle of insurance has ceased to be regarded as serious; and it is rapidly assuming the character of a more expensive form of Poor Law relief. But the mere shutting up of the Ministry of Labour, desirable as I believe that course to be, would not of itself remove our difficulties. We have surrounded the individual man with obstacles to work. We not only tell him that it is somebody else's job to find him a job, but we add, in order to strengthen that unnatural proposition, all sorts of prohibitions and restraints which bar the way of the enterprising fellow who desires to do without official assistance.

#### Modern Economic Heresy

Nobody knows of the numerous hardships of this kind better than the genuine unemployed himself. If he tries to do a little natural buying and selling he may find himself in conflict with the police over a hawk's licence or, failing that, he will be up against some trade ring. To give only one example, if he thinks he might sell a few books, no publishers will give him supplies until the Federated Booksellers or Associated Publishers have decided that he is qualified to receive trade terms, a decision which they are not very likely to take. The same sort of difficulties crop up in almost any trade he may choose. If his inclinations are of a more simple character, and he approaches a building job or a printing office, he will find his prospects blocked by the absence of a ticket which some labour monopoly declines to issue to him. If he tries to emigrate he will find so many official organisations to help and examine and qualify him, that he will give up the attempt in despair. Whatever he decides to try, he is absolutely forbidden by popular modern economic heresy from getting into any job or market by the natural process of cutting the price. A trade board will get on his heels if he attempts any homework, and, above all, unless when he goes to draw his weekly dole he can swear that he has been completely idle, he loses the pittance on which he now relies. It is rather difficult in these circumstances to blame the unemployed; they are the product of our own plans for improving the condition of the world. They are part of the price we pay for social reform, and the more reforming we do, the greater will be the number of those who rank as unemployed.

If arrangements made by the State provide for the payment of benefits in given circumstances, it is natural, and even in some circumstances right and proper, for the citizen to arrange his affairs in such a way as to qualify for those benefits. Who, for instance, can quarrel with the girl who, on leaving her employment to get married, requests her employer to go through the formality of a dismissal in order that unemployment pay may be added to the new family budget? The thing is natural and inevitable. As time goes on, increasing numbers are always finding ways to get themselves within the range of these benefits, and they have every bit as much right to adopt this course as has the tradesman who, faced with two ways of doing the same transaction, selects the one which will involve the lower taxation. If a motor manufacturer can regulate the length of the stroke and the size of

the bore to reduce the tax, the labourer is equally entitled to plan his work with a view to advantages offered and given by a badly run State.

#### The Spirit of Dependence

These aspects of a difficult and complicated problem come into better perspective when we consider that practically none of all the talk and writing about unemployment makes any direct appeal to the employed or unemployed themselves. It appears to be agreed on all hands that they are the helpless victims of circumstances beyond their control and hardly a word is said of their own responsibility or still less of their own potentialities. Human nature being what it is (a dangerous and forbidden phrase), the vast majority of the workers ignore our official folly and look after themselves, a simple little natural fact that saves us from complete disaster. But nobody seems to imagine that among the million-and-three-quarter recipients of State allowances there would be even a minority who would respond to any form of encouragement to self-endeavour. Our public policy is clear and definite; we appear to be determined to cultivate the spirit of dependence and to multiply the numbers of those whose conception of citizenship is the right to an income.

This abuse spreads far beyond the limits of the working class, as every day we add to the number and variety of the doles available for people who do not care to stand on their own. Indeed, nobody stands "on his own" in this rationalised world if he can help it. When a local authority makes a road, the cost is covered up in a Treasury grant and most of the things which we do in our corporate capacities are apparently paid for by somebody else. We have fooled ourselves into a condition of complete irresponsibility; the Chairman of the Finance Committee of a County Council boasted recently that 73 per cent. of the county budget was outside the jurisdiction of the Committee, the Council or the county. Wherever one turns the fashionable tendency to depend upon the State is apparent. I would like to see a return showing the number of young people from the universities and secondary schools who are leading a life of irresponsible security in obedience to the new obsession for organised research. They are all on the dole. As we go on increasing the numbers of those whose conception of the State is as a payer of wages and decreasing the numbers of those who realise that the State can only derive its support from the citizens, so our position must get weaker.

### Chemical and Other Trade Publications

#### The Use of Explosives

A WELL-PRODUCED booklet on the use of explosives in oil and water wells, metal-breaking, submarine and demolition work, etc., has been published by the Explosive Sales Department of Imperial Chemical Industries, Ltd., London, S.W.1. It is the successor of their booklet on *Metal Breaking with Explosives and Other Uncommon Blasting Operations*, and is intended to be supplementary to the three other publications of the Department on explosives and accessories, blasting in collieries, and on explosives in agriculture. Details are given of the nature of the charges to be used for various undertakings of widely different natures, the methods to be adopted for fixing them and precautions to be taken. There are several "before and after" illustrations of demolition work with explosives and diagrams of containers.

#### Weight Conversion Tables

A useful booklet containing tables for converting English weights to kilos and *vice versa* has been published by Davidson, Park and Speed, Ltd., steamship agents, 34, Great St. Helens, London, E.C.3. There are 21 pages of tables, and figures for all weights from 1 lb. to 100 tons are instantly available. The price is 6d., and a complimentary copy is offered to readers making application at the above address.

#### The Lea "Cubi-Meter"

The Lea "Cubi-Meter" system for measuring coal and other materials in bulk is described in a booklet of the Lea Recorder Co., Ltd., 28, Deansgate, Manchester, who have recently installed machines at the Kipps Coaling Station, near Glasgow, of the L.N.E.R., for the measurement of coal supplies to locomotives. These machines have to deal with

all sorts and sizes of coal up to 36 in. by 18 in. lumps, and they measure at the rate of 1½ tons per minute. The theory of "equal volume—equal weight" is explained at some length in the booklet, and there are numerous illustrations of the application of the "Cubi-Meter" in widely differing industries in various parts of the country. A striking diagram shows the Lea Water Recorder and the Lea "Cubi-Meter" side by side, the former with a guaranteed accuracy within 1 per cent. and the latter within 2 per cent.

#### Flameproof Induction Motors

Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, have published a descriptive leaflet and price list of their MS, MK and MW flameproof induction motors, which are totally enclosed machines designed for use in coal mines, gas work, chemical factories and other places where an explosive mixture is liable to occur in the surrounding air. Besides passing official tests at Sheffield University they have been tried out in a pentane air mixture with entirely satisfactory results.

#### Electric Hoist Blocks and Cranes

Details of Bamag electric hoist blocks are contained in a booklet recently issued by Bamag-Meguinn (G.B.), Ltd., Broadway Buildings, Westminster. These blocks can be supplied in lifting capacities varying from ¼ to 8½ tons, suitable for all loads and either fixed, for dealing with loads at one place, or travelling. They are made for all normal types of current and are all tested before despatch with 25 per cent. overload. The same firm has also issued a handsome 100-page brochure illustrating and describing Bamag cranes, elevating and conveying machinery. One section is confined to photographs of imposing Bamag plant supplied to gasworks, railways, port authorities and other industrial concerns.

#### Metafiltration

The many and wide industrial fields for which Metafilters have been adapted is shown in the latest catalogue of Metafilters (1929), Ltd., Belgrave Works, Hounslow, Middlesex, and it is claimed that in most cases the special details of the Metafilter give it great advantages over other filters. The basis of the system lies in filtering members made up of strips or rings, of almost any size and any material. They may be designed to work under pressure in closed containers or under vacuum in open containers and generally speaking filters can be built with the metafilter unit as the essential part, the other details following the lines of almost any type of filter employing cloth or other medium. The sections of the catalogue now issued besides a general description of the system include sections dealing with the special adaptation of Metafilters for laboratory use, for filtering beer, water, spirits, varnish, sugar, etc.

#### Hilger Apparatus

The new general catalogue of the manufactures of Adam Hilger, Ltd., 24, Rochester Place, Camden Road, London, N.W.1, concerns the instruments contained in sections D, E, F, H, K, L, M, and N of the earlier issues of their general catalogue with certain additions. Its 250 pages cover a wide range of highly specialised apparatus, much of which was introduced by Hilgers nearly 30 years ago and several of the instruments in their latest form embody a number of important improvements. Apparatus appearing in this edition for the first time includes a large aperture quartz monochromatic illuminator; new rapid steel sorting spectroscopes; one meter vacuum spectrograph; Hilger X-ray crystallograph; Professor Laby's X-ray spectrograph for wave-length measurements in the X-ray region which can be investigated in air; Holweck vacuum pump; Gramont arc and spark stand; complete Nutting colorimeter outfit; survey stereoscope and contour plotter, and ultra-violet Etalon-refractometer.

The Vacuum Oil Company, Ltd., Caxton House, Westminster, has issued a brochure on Lubricating Oil Specifications setting out the physical, chemical and mechanical tests applied to lubricating oils and their relative values.

An A.B.C. wall chart of packing materials for pump and other shafts has been issued by W. F. Johnson and Co., General Agents, 14 and 16, Farringdon Road, London, E.C.1. Palmetto, Cutno, Pelro and Palco are the packings listed, and there are over sixty substances on the chart for which one or other of the four is recommended.



## The Investigation of Water Pollution Problems

### Report on Recent Progress

*In the report of the Water Pollution Research Board for the year ended June 30, 1929, issued by the Department of Scientific and Industrial Research (H.M. Stationery Office, pp. 24, 9d.), Dr. H. T. Calvert, the director, reviews the progress of the work during that period. Sir Robert Robertson, the chairman of the Board, also contributes an introductory summary from which the following extracts are taken.*

DURING the past year there has been evidence from several quarters of a growing appreciation of the benefits to be derived by the community as a whole from efforts to ensure that the rivers and water supplies of the country are kept as free from contamination as possible.

The prevention of pollution is a problem the solution of which becomes of greater importance every year with the growth of the population and the development of industry. The growth of the population increases the work of disposal of sewage and improved sanitation is throwing a greater burden on the water supplies, the purity of which is an important factor affecting the health of the community. In addition to the requirements for domestic purposes, water of good quality, and in considerable and increasing quantity, is also necessary for many industrial processes. It thus seems inevitable that as time progresses, rivers will have to be utilised to a greater extent as sources of water supply for both domestic and industrial purposes.

The unrestricted and uncontrolled discharge of polluting liquids from manufactories must, in many instances, render the water supplies most easily accessible to adjacent factories quite unfit for the purposes for which they are required, and there is no doubt that the application of practicable methods of avoiding or alleviating the effects of pollution and the scientific development of new methods will prove of benefit to industries generally.

Attention was drawn in our first report to the desirability in beet-sugar factories of re-using water to the fullest practicable extent, and it was pointed out that, in general, less drastic treatment should be needed to render the waste waters fit for re-use than for discharge to a stream. The various factors to be taken into account were considered, and several suggestions in regard to methods of treatment were discussed. It is gratifying, therefore, to observe that these suggestions have been adopted at several factories with a considerable amount of success.

The Research Committee of the Institution of Gas Engineers has issued three reports, the first of which summarised existing knowledge of the difficulties caused by effluents from the distillation of ammoniacal liquor and of methods tried and suggested for surmounting these difficulties. The second and third reports described small-scale and large-scale experiments with the objects of reducing the quantity and improving the quality of the liquor effluents from gas works and on methods of purification.

In connection with the disposal of industrial effluents, the Federation of British Industries has set up a committee to consider certain questions of general interest. On that committee, the trades represented are concerned with food manufacture, dairying, chemicals, oil refining, gas, coke and by-products, distilling, iron and steel, paper making, leather dressing, bleaching, dyeing, laundering, woolcombing, calico printing, rayon manufacture.

#### Survey of the River Tees

It was mentioned in our first report that we had come to the conclusion that a scientific survey of a typically polluted river would furnish valuable information of general as well as local application. It is known that rivers which have received polluting liquids are capable of self-purification under the right conditions, but there is a lack of exact information regarding those conditions and the quantities of different effluents which can be allowed to enter a river without unduly retarding the processes of self-purification.

On our recommendation, the Department arranged to undertake a scientific survey of the River Tees at the sole cost of the Department for one year in the first instance. A comprehensive biological, chemical and hydrographical survey of a river involves the securing of a team of investigators, each with a specialised training and experience in his particular branch of the work, and in this connection difficulties might have arisen. Fortunately, there were organisations in

existence with scientific staffs possessing the training and experience required, and arrangements have been made whereby the biological and chemical survey of the non-tidal section of the river is being carried out for the Department by the Ministry of Agriculture and Fisheries, and the biological and chemical survey of the tidal section is being carried out for the Department by the Marine Biological Association of the United Kingdom. For the hydrographical work an experienced surveyor has been appointed, and this section of the work is being conducted in close consultation with the Hydrographer to the Navy.

#### Base-Exchange or Zeolite Process

A summary of existing knowledge of the base-exchange or zeolite process of water softening has been prepared during the past year as a technical paper. In this process the hard water is made to flow through a bed of material suitably graded as regards size. The material employed, which may be a treated mineral or may have been artificially prepared, consists of a sodium aluminosilicate possessing the property of base-exchange. The sodium enters into solution in the water, from which an equivalent quantity of calcium or magnesium is removed by the solid. The calcium or magnesium zeolite (the term zeolite is here employed in reference to all base-exchange materials) is afterwards regenerated with brine, and thus reconverted into sodium zeolite for further use.

Although there is a good deal of general information about the process, there is little knowledge of the mechanism of base-exchange from the physico-chemical point of view. The Department therefore arranged for an investigation of the process to be carried out at the Chemical Research Laboratory at Teddington with reference to the following points: The rate and extent of the base-exchange; the deterioration and loss of material; the influence of the size and texture of the particles of material, as indicating to what extent the action is dependent on the surface exposed; the possibility of the contamination of the softened water by silica and alumina. This investigation is still in progress, and many experiments have already been carried out on treated minerals and manufactured zeolites. Our colleague, Sir Alexander Houston, has also conducted experiments designed to ascertain whether there is any change in the bacterial population of water as a result of treatment by the base-exchange process.

#### Beet-Sugar Factories' Effluents

The disposal of waste waters from beet-sugar factories continues to present an important problem which has not yet been in all cases satisfactorily solved, though the investigations which have been carried out by the Department and by the industry show promise of leading to methods of alleviating the difficulties and of affording a solution of the problem.

Prior to the 1927-1928 campaign, the Department made arrangements with the Rothamsted Experimental Station to conduct semi-commercial scale experiments on methods of biological filtration, in extension of laboratory experiments which had previously been carried out with promising results. Two experimental filters, each 25 ft. in diameter and 6 ft. deep, were erected at the beet-sugar factory at Colwick, where facilities were provided through the kindness of the Anglo-Scottish Beet Sugar Corporation, Ltd. The filters were constructed to the designs of our colleague, Mr. H. C. Whitehead, engineer to the Birmingham, Tame and Rea District Drainage Board, who kindly permitted him to supervise the constructional work. Each filter was divided into two halves, making four filters in all. The filters were built up of the following media: Filter No. 1, 1-2 in. gravel; filter No. 2,  $\frac{3}{4}$ -1 in. slag; filter No. 3, 1-2 in. clinker; filter No. 4,  $\frac{3}{4}$ -1 in. clinker. During the 1927-1928 campaign, when the filters were employed for the treatment of pulp press water diluted with other waste water, at a rate of feed of 100 gallons per cubic yard per day, a purification of 70 to 80 per cent. was obtained. Measurements of the "time of contact" of each

filter at the end of the campaign by Clifford's method, however, gave results ranging from 65 to 81 minutes. Laboratory experiments had indicated that a "time of contact" of about four hours was necessary to obtain the desired purification of over 90 per cent.

On our recommendation, certain alterations and additions to the experimental plant were made, including the replacement of the material in two of the filters by finer material graded  $\frac{1}{4}$  in., and the experiments were continued during the 1928-1929 campaign. The fine filters effected a purification of over 90 per cent. when treating a mixture of 60 parts of flume water and 40 parts of pulp press liquor at a rate of 100 gallons per cubic yard per day. The flume water had been subjected to partial settlement before admixture with pulp press liquor, but it still contained appreciable quantities of suspended matter. This suspended matter was largely deposited in the filters, which as a result showed signs of ponding at the end of the campaign of 69 days. It is probable that with a long campaign, the deposition of suspended matter in the filters might be sufficient to put them out of action. The quantity of suspended matter in the liquor fed to the filters might be reduced by avoiding the use of flume water and employing river water or effluent from the filters to dilute the pulp press liquor.

We regard the results obtained by biological filtration during the last campaign as distinctly promising, and we have accordingly recommended that the investigation be continued to ascertain whether further improvements can be made by diluting the pulp press liquor with river water or with effluent from the filters in place of flume water.

During the 1928-1929 campaign the general survey of the organisms present in the filters was continued, and measurements were made of the changes in the quantities of film with the object of correlating the results with changes in the efficiencies of the filters. Pure cultures were isolated for physiological examination in the laboratories of the Rothamsted Experimental Station.

We are pleased to say that the investigation was continued in co-operation with the industry, which made a second contribution of £1,000 towards the cost, on the recommendation of the Effluents Sub-Committee of the Beet Sugar Factories' Committee of Great Britain. We also wish to express our appreciation of the continued zeal of the staff engaged on the investigation both at Colwick and Rothamsted.

## Alluvial Tin

### Cornish Scheme Deadlock

MR. J. H. THOMAS, in reply to a recent question in the House of Commons, stated that he is making inquiries into the scheme for the recovery of tin from the bed and banks of the River Tamar. A resolution of Plymouth City Council has urged that, in view of unemployment in the neighbourhood, every encouragement should be given to bring about an early establishment of the industry.

The scheme, as explained to the Plymouth City Council, the Plymouth Chamber of Commerce and the Devonport Mercantile Association—all of whom have given it enthusiastic support—by a representative of the promoting company, the New Consolidated Gold Fields, Ltd., provides for the expenditure of a sum of from £10,000 to £50,000 on preliminary testing operations which, if they prove successful, are to be followed by an outlay of £500,000 to £800,000 on plant and apparatus, all of which will be spent in this country. The total capital to be employed in the undertaking, which is all being found by the company itself, is put at anything from one to one and a half million pounds.

The company has received a grant of the mineral rights in the Tamar from the Duchy of Cornwall, but a condition of this is that the methods of dredging for the recovery of tin shall be approved by the Admiralty, the Board of Trade and the Duke of Bedford. Conferences which have taken place between the officials of the company and the two first named indicate that there will be no opposition from those quarters. With the Duke of Bedford, however, the negotiations have reached a deadlock, and the promoters have now sought the aid of the Plymouth Chamber of Commerce and the Devonport Mercantile Association, as well as the Duchy of Cornwall, in an endeavour to persuade the Duke of Bedford to withdraw his opposition.

## The Physicist in Industry

### Influence on Development of Wireless

"THE Influence of Physical Research on the Development of Wireless" formed the subject of Dr. W. H. Eccles's presidential address before the Institute of Physics in London on Tuesday.

Until nearly the end of the war, he said, physicists who were occasionally called upon to enter the service of the State were officially classed as "chemists," as the word "physicist" had not appeared in the official vocabulary; and those who had entered industry did so in the guise of "engineers." The need for a professional Institute of Physics was evident and the stability which it had attained after a life of ten years showed that its founding was justifiable. The physicist had already proved his value in industry, and the subject of wireless telegraphy and telephony had been chosen for the address as an illustration of the constructive work of the physicists in a typical modern enterprise.

After purely scientific investigations had provided the means and materials, wireless telegraphy was born at the British Association meeting at Oxford in 1894 when Lodge sent Morse signals from a spark apparatus worked by a telegraph key and recorded them on a moving paper tape by receiving apparatus at a distance. Later in 1897 Lodge's laboratory produced the method of tuning aërials by inductance coils, thus enabling each transmitting station to correspond with a selected receiving station tuned to it. Another laboratory product was the arc generator of continuous waves (due to Duddell and Poulsen). It led the way to wireless telephony, which was developed rapidly by Fessenden, a professor of physics, until in 1907 the human voice was heard across the Atlantic. This ranked as the greatest achievement of wireless up to that date, for telephony was then impossible on long cables.

### Amplifying Valve and Its Consequences

In 1913 the amplifying valve came to maturity; it was purely the work of physicists, the use of a grid being traceable to the experiments of a German physicist in 1902. The coming of the valve brought two consequences, firstly the scrapping of the great spark stations which had been laboriously developed during 15 years of pioneer engineering work, and, secondly, after the war, the popularisation of wireless telephony in the form known as broadcasting. Many other less impressive technical developments and improvements could similarly be attributed to the introduction by the physicist, from time to time, of new principles and ideas into the technique of wireless.

At the present moment the industrialists of this country were indulging in profound self-examination, and there was much discussion of the process called rationalisation which was brought into prominence in 1927 by the World Economic Conference at Geneva. The main object of rationalisation was to reduce the costs of production and operation in important industries, and its aspects were multitudinous. But, keeping to the technological side, an important instrument of rationalisation was standardisation, and another was the modernisation of plant and products by the introduction of the latest invention and knowledge. There was a certain amount of contradiction here, for standardisation was opposed to modification; and the conflict had not yet been thoroughly discussed. To put the matter another way, it was not economic to standardise machinery or products too soon, before the latest improvements have been incorporated, and, on the other hand, it was not economic to modify a standardised form until the costs of adopting it had been recovered.

This conflict was well illustrated in the history of wireless and unceasingly appeared in many industries, such as the electrical industry, and therefore the physicist was deeply concerned in it. To those responsible for making decisions it was no easy task to settle when to introduce improvements and when to stop improving in order to standardise. They probably regarded the physicist as the villain of the piece; for he had been, in certain industries, the cause of many a sudden change of direction, the source of many a revolutionary idea. But the better view of the position of the physicist in this matter was that he possessed potentialities for helping as well as for disturbing the stability desirable even in progressive motion; being intimately connected with the laboratories whence sprang the sort of invention that shattered the established technique, he was better equipped than others to forecast in some degree the direction of forthcoming change.

## East End Hostels : Great Mansion House Banquet

A Record Subscription of £2,200

OVER 300 guests assembled in the Mansion House, London, on Tuesday for the annual banquet of the East End Hostels Association. Viscount Astor was the chairman, and the many speakers bore names distinguished in the civic, political and business life of the country. The banquet took place in the famous pillared dining hall, kindly placed at the disposal of Sir Ernest Benn, the President, and the Council of the East End Hostels Association, by the Lord Mayor (Sir William Waterlow). At the end of the speeches, Mr. A. Townshend, the Warden of the John Benn Hostel, announced that the Association would benefit by a record sum of about £2,200 contributed during the evening.

### A Message from the Prince

After the toast of the King, the Chairman read the following message from the Prince of Wales, who inaugurated the John Benn Hostel and Milner Hall in 1927 :—

"I was delighted to hear that the Lord Mayor had given permission for to-night's banquet to be held in the Mansion House, and also that the Corporation of the City of London has subscribed to the funds of the John Benn Hostel, thus giving a mark of their approval to the work which I inaugurated by opening the Hostel in 1927.

"The high hopes expressed at the opening ceremony have not been falsified in the three intervening years, and from what I saw of the normal life of the Hostel on my second informal visit in 1928, I remained convinced of the vital need of work of this kind for boys in London.

"It is my intention to pay another visit to the Hostel before the close of the year, when I hope to hear that as a result of the Mansion House Banquet a record subscription will have been raised in 1930 for carrying on this fine constructive work.

EDWARD P."

### The "London Boy"

The toast of "The London Boy" was proposed by the Earl of Feversham, who asked whether any toast could be occupied with a more kaleidoscopic subject. The London boy, in school, was clean, alert and active. He took in the teacher's instruction with one eye and one ear, and with the other eye and the other ear he sought opportunities to place a pin for his classmate to sit upon. (Laughter.) Out of school he was generally noisy, boisterous, and sometimes dirty. In his home he was sometimes obedient and sometimes not, when he was good he was very good, and when he was bad he was horrid. Perhaps it was when he was courting that we loved him best, in the time when he was preparing for the responsibilities of parenthood.

Miss E. S. Haldane responded to the toast, and confessed that to her, in the boy full of fun and mischief, mischief was, perhaps, the most endearing quality. They knew how some people lived in the East End of London, and what chance had a boy there of growing up an honourable and healthy citizen? It was the business of those more fortunately situated to give them a chance, somehow or another, as, for example, they were given a chance in the John Benn Hostel. She urged all who had not been to the Hostel to pay it a visit. Then they would see what the boys were, the fun they were having, what they were learning, the chances they got, and how they were cared for over the difficult years of adolescence.

### Lord Astor's Tribute

Viscount Astor gave the toast of "The John Benn Hostel." The fact that they were dining in the Mansion House was, as the Prince of Wales had pointed out, evidence that they were past the experimental stage and were a proved success. He joined with Miss Haldane in urging his hearers to go and see the Hostel for themselves. He came away with a feeling of joy, hope and gratitude that it had been his privilege to see it. He witnessed something of the work on its educational, recreational, and social sides. He saw boys at work carpentering and others in the swimming bath, where an apparatus was installed that purified the water every four hours, and sent it back almost fit for drinking. On a stage admirably equipped for theatricals he saw other boys acting a scene from Shakespeare, and showing real natural aptitude. Whatever the visitor did, Viscount Astor enjoined him or her not to miss the dormitories, and to get an explanation of the way in

which discipline was maintained and *esprit de corps* created. The boys' characters were being trained; they had an old boys' association, and after they had left they nearly always retained for the Hostel the affection that other boys felt in after life for a good school. They had the sort of corporate pride that ought to be developed in the citizen. All would wish Sir Ernest Benn well as a successful missionary and a great benefactor.

### Sir Ernest Benn on the Hostel Claims

Sir Ernest Benn, in reply, said that when anyone had visited the Hostel, he remained for the rest of his life a walking advertisement for the work they were carrying on. That was, of course, of immense value to their efforts. Lord Astor had followed the remarkable example of the Prince of Wales, who not only formally opened the Hostel, but had maintained the closest personal interest ever since. Sir Ernest also thanked the Lord Mayor for his kindness in lending the Mansion House for the banquet.

There were two points, he said, that he wished to mention, one in regard to their work, and the other in regard to finance. Three years ago upon a visit to the Hostel he found a group of fourteen or fifteen boys at work, and he was informed that they were a minstrel troupe. Never in his life had he seen such a complete absence of histrionic ability. To-day their minstrels were in great demand all over London and from those efforts had sprung a dramatic club which was to appear at the Old Vic next week, having fought its way to the finals in the Stewart Headlam Shakespeare Competition (applause). That was only a sample, but when that sort of thing went on, they could claim that their wonderful staff at the Hostel was doing something to fortify the moral sense of all.

Turning to finance, Sir Ernest said that they spent something like £7,000 a year in running the Hostel and the community centre, and mentioned also the very striking fact that one-third of that sum was contributed by the boys themselves. It was a little difficult to divide the figures exactly, but it might roughly be said that one-third of the expenditure was upon the community centre, and if that were so the boys provided 50 per cent. of every 6d. spent upon the Hostel. That would help them to understand the motto of the Hostel, "No pains, no gains," chosen by the boys themselves and forming a striking illustration of the spirit of the institution. At the outset of the Hostel's career, the Carnegie Trustees gave £10,000, and, looking upon the venture as an experiment, took a mortgage on the building. Since then, the Trustees had expressed satisfaction of the highest order with the conduct of the Association, and had suggested that if an endowment fund were set up, they would tear up the mortgage or return the deeds. This explained why the Association was anxious to see on the other side of the balance sheet the sum of £10,000, so that it could rely upon a regular income.

Mr. J. H. Thomas, M.P., who arrived straight from the House of Commons, but assured his hearers that he had not been delayed by a Cabinet crisis, spoke of the rise to power of democracy, and emphasised the importance of early training in good citizenship, such as was provided for boys otherwise without help in an institution like the John Benn Hostel, if democracy were to use its power with wisdom and credit to the Empire. He spoke also of his own association in other days with the late Sir John Benn and the late Lord Milner, in memory of whom the Hostel and the community centre had respectively been founded.

Mr. W. Clarke Hall, the well-known London magistrate, proposed "No pains, no gains," and spoke of some of the difficulties and perils which beset the path of the East End lad and which the work of the Hostel did so much to lessen.

In a witty speech the Secretary of State for India (Mr. Wedgwood Benn, M.P.) replied.

The health of the Lord Mayor of London was honoured at the call of the Mayor of Stepney (Alderman H. Lazarus), who proudly claimed to be a London boy himself. The toast of the Chairman was proposed by the Earl of Elgin, who referred to the happy amalgam of East End boys, West End boys, and all sorts of other boys (including himself as a boy from north of the Tweed), that had produced the good work of the Hostel and their gathering that evening.



## American Impressions of European Chemical Industry

By F. J. Curtis

*The writer, who is a chemical engineer associated with the Merrimac Chemical Co. of Boston, U.S.A., has recently been on a tour in Europe, and in the May issue of "Chemical and Metallurgical Engineering" he records some impressions of chemical developments. Mr. Curtis, during his fifteen years' connection with the Merrimac Co., has served as control chemist, research chemist, department superintendent and, more recently, director of engineering research and development.*

In several months spent in England and on the Continent I had the opportunity of examining certain major divisions of the chemical engineering field, including acetic acid and allied products, sulphuric acid, sugars from wood, nitrogen fixation, nitric acid and salt cake, cellulose acetate, and various miscellaneous research developments in Germany which probably are of future importance. Without attempting to carry this report beyond the strictly reportorial stage, I have set forth the principal observable facts concerning the present technical status in each of these fields.

### Acetic Acid

During 1929 acetate of lime brought higher prices in the United States than in Europe, which increased the exportation of this commodity from European countries. At the same time, as in the case of the United States, there was a tendency for expansion in acetate rayon, increasing the demand. The result has been the development in England of one plant to make glacial acetic acid from imported carbide, and another, by a combination of English and German companies, from alcohol. This latter process oxidises the alcohol catalytically to acetaldehyde, furnishing the same base material as is obtained in the carbide process from acetylene. It is planned to go to acetic acid, ethyl acetate, and acetone by direct catalytic methods, and through crotonaldehyde to butyl alcohol. There is, of course, an advantage in this method of producing butyl alcohol, in that no acetone is made. The universal opinion seems to be that the synthetic production of ethyl alcohol is quite possible technically, but not economically.

Acetic acid recovery methods, such as the Suida process (which extracts a mixture of acetic acid and steam in the vapour phase by means of wood tar oils), are increasing, especially in connection with acetate silk mills. A German company has a process worked out for converting acetic acid catalytically to anhydride, the two together giving flexibility to acetic acid recovery in acetate rayon plants, which use both glacial acetic acid and acetic anhydride. This procedure is superior to the old sodium acetate recovery method, which furnishes anhydride alone.

### Sulphuric Acid

During the last few years it has seemed that the United States is moving more and more in the direction of the contact plant, a movement which has been accelerated by the introduction of the vanadium catalysts. Europe, while not neglecting the contact processes, has also been developing the various chamber processes. A new Mills-Packard design has superior methods of supporting the lead and taking care of expansion and contraction. The angle of slope of chamber walls also has been decreased. The Gaillard type of plant has been showing an expansion on the Continent, although none has been installed as yet in England. Work is being done on the use of water cooling on the outside of the Gaillard tower in conjunction with acid spraying inside, especially in Australia.

A Petersen plant in Belgium has solved the problem of dealing with cold dilute  $\text{SO}_2$  gases. In a way, the Glover and Gay-Lussac towers have been eliminated, although the functions of the towers necessarily go on. The plant has five towers all of the same height, but the last three are nearly three times the diameter of the first. Acid circulation is very complicated. Periodically the first small tower is cut out of the acid stream and the acid to be removed from the plant is here circulated until free of nitre. Dior chambers, which are conical in shape, use both inside acid spraying and outside water cooling. Chambers of this type have not

increased in use, although such operation does show some advantage in high capacity at 2.3 cu. ft. per pound of sulphur per day. This is offset against a high nitre consumption of 5 per cent.

A new plant employing the Schmiedel process, which uses lead boxes containing rolls rapidly revolving in fairly concentrated nitrous vitriol to give a spray, is being created in Silesia. It is claimed to have 4 per cent. nitre consumption and capacity of 2.13 cu. ft. per pound of sulphur. It is also claimed that the roller box may be substituted for the Glover tower when using cold gases.

More attention apparently is paid to cutting down dust production in pyrites burners than in the United States. The Bracq-Laurent furnace, which has a helicoidal hearth, avoids the dropping of the pyrites through the air. The Harris furnace has separated passages for pyrites and gas, so that the two do not come in contact with each other. A furnace of the Erzost Gesellschaft is equipped with special arms on the central shaft carrying chutes which conduct the pyrites from shelf to shelf. Cottrell precipitators are standard equipment for eliminating dust and fumes. A lively competition in vanadium catalysts is now in process between the Lurgi, I.G. Farbenindustrie, Monsanto, Selden, and Kuhlmann masses.

### Sugars from Wood

This process, as developed at Hamburg, for treating wood waste by means of dilute sulphuric acid has become successful enough to be given an alcohol quota. Another process being carried out in the Rhineland uses muriatic acid for the hydrolysis, but so far only a small plant has been constructed.

### Nitrogen

The outstanding development in the past two years has been the use of coke-oven gas, particularly in the Ruhr district, as a source of hydrogen. One company in France is successfully producing ethyl alcohol from the ethylene obtained in purifying coke-oven gas in a Claude ammonia plant. The great plant of Imperial Chemical Industries at Billingham is being steadily pushed forward and new units are being brought into production. A Belgian company has developed the production of hydrogen from methane, thus utilising all of the hydrogen in coke-oven gas.

### Salt Cake

Shortage of this material has recently arisen, due to almost complete change in the method of manufacturing nitric acid. Where sodium nitrate was formerly used as the raw material, ammonia has now taken its place. Salt cake must be increasingly produced from salt and sulphuric acid rather than nitre cake. Waste from the German potash mines, which is the greatest source of natural sodium sulphate, is still only half utilised, and with the increase in prices, development may be expected in this quarter. One of the Italian companies is successfully producing glauber's salt in connection with pyrites cinder leaching operations.

### Cellulose Acetate

The largest British company is increasing its production and another has a plant just started. A new plant is under construction in Belgium. In Germany the I.G. is a large factor in this field. Methods of recovery of acetic acid will play a very important part in the ultimate development in this industry.

### Research

Interesting developments in research in Germany are in evidence in several of the research laboratories. At the Kaiser Wilhelms Institut für Kohlenforschung at Mülheim, 90 per cent. of the methane in coal gas has been converted to acetylene by passing it through an electric arc, thereby increasing the hydrogen percentage in the gas from 50 to 75. This acetylene has been converted by catalysis to paraffin oils and to acetic acid.



Benzol has been synthesised from water gas and is found to be equal in every way to the natural product. Bacteria have been developed which remove carbon monoxide from water gas and coal gas by reducing 98 per cent. of the CO to methane and water. Molds flourishing on brown coal convert it to an organic form available as plant food. Experiments on brown coal show the possibilities of completely eliminating the ash, so that the dust can be used as a motor fuel. At the Kaiser Wilhelms Institut für Physikalische Chemie, under the direction of Haber, the basic principles of catalysis are being investigated as a step toward the intelligent discovery of new catalysts. Atomic hydrogen has been found under some circumstances to act as an oxidising agent and to have two forms, ortho and para, the properties of which are being studied.

### Judgment Reserved in Lever Action

#### The Jury's Findings

MR. JUSTICE WRIGHT on Tuesday reserved judgment in the action in which Lever Brothers, Ltd., and the Niger Company, Ltd., claimed damages against Mr. Hyslop Bell and Mr. Walter Edward Snelling, the former chairman and vice-chairman of the Niger Co., Ltd., and the return of £30,000 and £20,000 which the defendants received as compensation for loss of office when the Niger Company was amalgamated with the African and Eastern Trade Corporation. The plaintiffs alleged that the defendants appropriated to themselves contracts which had originally been entered into on behalf of the Niger Company, Ltd., or, alternatively, that the defendants had engaged in buying and selling cocoa on their own account in breach of the terms of their contracts of employment. The defendants denied the allegations. The case has occupied twenty days.

After a four hours summing up on Monday his Lordship left a series of questions to the jury in reply to which they found that there had been no misrepresentation or concealment; no appropriation of contracts or of money. They found that the defendants' admitted dealings would have justified their dismissal, and would have led to their dismissal. The jury also found that when Lever Brothers entered into the agreements of March, 1929, they did not know of the acts of the defendants with regard to the four admitted transactions, and that, if they had done so, they would not have made those agreements. They further found that at interviews before the agreements were made the defendants did not have in mind their acts in respect of the four transactions. They awarded the plaintiffs £1,360 in respect of the profit made by the defendants, and £5 nominal damages.

### Lagunas Nitrate Capital Reduced

IN the Chancery Division on Monday, Mr. Justice Eve had before him a petition to confirm the reduction of capital of the Lagunas Nitrate Co., Ltd., from 180,000 £5 shares to a like number of £1 shares. The loss indicated was nearly three-quarters of a million, and was due to depreciation of the value of nitrate and iodine and to the company's products in Chile being worked out. The last dated balance sheet was December, 1928, but matters had been brought up to date as far as possible for purposes of this application. The assets were equal to about the amount of the capital fixed for the future capital, and included value of stores £67,000 and cash in hand £49,000. His lordship made the necessary order.

### A Chemical Works Treat

THE annual treat to the staff and workpeople of W. Blythe and Co., chemical manufacturers, Church and Hapton, was held on Saturday last and took the form of a trip to Blackpool. About 800 sat down to tea in the Winter Gardens, where Mr. Derek Blythe, chairman of the company, handed gold watches in recognition of 40 years' service to Messrs. Hargreaves, Kay, Robert Southworth and Ashton Dixon.

Mr. W. Collinson, the managing director, in a brief address, said, just as they could claim that their products were chemicals of quality, he believed they could justly claim that their employees were workers of quality. The directors would do their best to keep them fully employed, and he hoped that the workers on their part would do their best to assist them to meet the stress of competition which harassed them from outside.

### British Acetate Silk Corporation

#### Petition for Winding-Up

MONDAY next has been fixed for the hearing of a petition for the winding up of the British Acetate Silk Corporation, Ltd., presented in the High Court on May 21 by Johnson and Phillips, Ltd., of Columbia House, Aldwych. The Corporation was registered in March, 1928, to acquire from Bulmer Rayon Co., Ltd., the business of artificial silk and cellulose acetate manufacturers carried on by that company. The property acquired included freehold land in Suffolk of about 13½ acres, together with a well-equipped factory and a viscose silk plant. The purchase price was £690,000, including £50,000 for goodwill, paid as to £75,000 in cash, £600,000 in ordinary and £15,000 in deferred shares. The authorised capital of the company is £2,700,000, of which £2,048,496 is issued, £1,939,026 in ordinary shares and £109,470 in deferred shares.

The company's report for the period February 1, 1928, to September 20, 1929, stated that it had had to contend with many difficulties, both in respect of finance and of production. It had also been involved in internal disputes, mainly in connection with management, and these had materially interfered with the efficient conduct and proper development of its undertaking. Original estimates of expenditure on capital account were found to be entirely inadequate. A considerable amount due in respect of calls payable on shares had not been received. Arrangements, however, had been made which met these difficulties to a large extent.

The report stated further that, though considerable technical difficulties were encountered during the period, these had been entirely surmounted, and the silk produced was of a very high standard. The company's reputation in this respect in trade was definitely established, and the profit-earning stage was now well within sight.

### A Record Year for Patents

#### Wide Application of Chemical Advances

THE forty-seventh report of the Comptroller-General of Patents for 1929, issued on Saturday last, states that the year was marked by steady progress, especially in the chemical and electrical industries, but no very outstanding development could be identified.

The chemical advances of recent years, it is recorded, are now being manifested in their applications to other industries. Thus there is great activity in the use of cellulose derivations, in treating fabrics to obtain waterproof and fancy products or imitations of natural products, such as leather, and in the use of complex organic chemicals for the mothproofing of fabrics, furs, etc. The number of applications dealing with fertilisers is nearly four times as many as four years ago.

A record was established by the number of applications for patents received, 39,898, while the complete specifications filed (25,386) exceeded by 1,341 the number received in 1928, and was the largest number received in any year. The number of applications to register designs was 23,648, compared with 24,746 in 1928, the reduction being accounted for by the drop in applications for printed or woven designs on textile goods.

There was also a reduction in the number of applications for trade marks, the total of 11,753 being a decrease of 931 on 1928. The total receipts for last year were £578,206, an increase of £33,466. The surplus of receipts over expenditure was £157,005.

Trade marks for chemical substances used in manufactures, etc., registered in 1929, totalled 287, a decline of 14 on the figure for 1928. Trade marks for chemicals used in medicine numbered 348, a decline of 7, and for agricultural chemicals 129, an increase of 11.

### Industrial Gas Masks

"EVERTRUSTY" gas masks are described in a leaflet of Wallach Bros., Ltd., 49, Tabernacle Street, Finsbury Square, London. This firm are the agents for the masks manufactured by the Deutsche Gasglühlicht Auer Gesellschaft (described in the article by S. H. Katz in last week's *CHEMICAL AGE*), which they market in this country under the name of "Evertrusty Degea." A variety of apparatus is described and illustrated, and there is also a list of the most important poisons and irritant gases occurring in industry, with the appropriate chemical canister to provide a safeguard.

## From Week to Week

THE BAKERIAN LECTURE was delivered before the Royal Society on Thursday by Professor Robert Robinson on "The Molecular Structure of Strychnine and Brucine."

AN HONORARY DEGREE of Doctor of Science was conferred on Professor Arthur Smithells in connection with the jubilee celebrations of Victoria University, Manchester, on Friday, May 23.

SIR JAMES C. IRVINE, Principal and Vice-Chancellor of St. Andrew's University, is among those nominated by Mr. Baldwin, as Chancellor of the University of Cambridge, for the receipt of honorary doctorates.

FRENCH EXPORTS OF ALUMINIUM CHEMICALS in 1929 totalled nearly 64,000 metric tons, including 35,400 of alum (anhydrous), 23,000 of sulphate, 4,900 of hydrate, and 524 of ammonia, potassium, and other alums combined.

A FIRE occurred on Thursday, May 22, at the Branston Artificial Silk Company's factory at Burton-on-Trent in a building used for the melting of wax. It was subdued after half an hour's work by the company's fire brigade and corporation firemen.

THE LEA RECORDER CO., LTD., have now opened a branch office and showroom at Parliament Mansions, Orchard Street, Victoria Street, London (Tel. Victoria 0984), for the convenience of customers in London and the South of England, and also for dealing with overseas business.

THE LAW authorising the formation of the Compania Salitrera Nacional had a favourable reception in the Chilean Congress on Saturday last. Of individual producers over 83 per cent., including all the English companies and two-thirds of the German companies, have now joined.

PROFESSOR NIELS BOHR, University Institute of Theoretical Physics, Copenhagen, was presented on Monday with the James Scott Prize of the Royal Society of Edinburgh. Professor Sir E. A. Sharpey-Schafer, F.R.S., the president, occupied the chair and made the presentation, after which Professor Bohr delivered an address on "Philosophical Aspects of the Atomic Theory."

PLANS for the exploitation of 30,000 acres of coal-bearing land in the Maitland district of Australia, pursuant to an agreement between the Standard Oil Co., the German Dye Trust, and Imperial Chemical Industries, have been laid before the Warden of East Maitland. It is proposed to spend £3,000,000 on the erection of plant and to employ 6,000 men in the extraction of 30,000,000 gallons of motor spirit a year from the coal of this area.

A GOLD MEDAL "for distinguished economic service to the American Chemical Industry" is being designed and will be awarded to the outstanding business man in the chemical industry in the United States by a vote of his peers and competitors. The medal will be presented by our American contemporary, *Chemical Markets*, in celebration of the fifteenth year since the magazine was founded, and its tenth year since Mr. William Haynes became its publisher.

THE STANDARD OIL EXPORT CORPORATION, it is reported from America, proposes to increase its capital by \$2,000,000 to \$77,000,000, to provide for the acquisition of all the outstanding stock of the Anglo-American Oil Company. The merger will be carried out through an exchange of stock on the basis of one share of the Standard Oil Export Corporation 5 per cent. preference for each 5½ shares of the Anglo-American Oil Company.

THE REPORT of the Area Gas Supply just issued recommends the immediate institution of a network scheme to collect and distribute to bulk users the surplus gas for a large number of coke ovens in the Sheffield area. Nineteen coke oven plants are included in the South Yorkshire scheme and the suggestion is that a maximum volume of 80,000,000 cubic feet of gas should be taken daily at a uniform rate of delivery. The gas is to be purified at the coke ovens before delivery, and the total length of the mains (which are to be of steel) is approximately 73½ miles. Relatively low pressures are to be employed and the compressor plants are to be installed at the ovens, the owners of which are to include the cost of compression in their price for gas.

RECENT WILLS include Dr. Kennedy Joseph Orton, Bangor, Professor of Chemistry at the University College of North Wales (net personalty, £16,126), £16,304.

MR. ARTHUR HOLLOWS, a retired official of Imperial Chemical Industries, Ltd., has been returned unopposed as the Northwich member of the Cheshire County Council.

MR. T. TICKLE, of Exeter, has been recommended by the Agricultural Committee of Devon County Council as full time analyst for the county, in succession to the late Mr. F. V. Dutton.

THE SECOND INTERNATIONAL Benzole Conference, convened by the National Benzole Association, opened at Grosvenor House Hotel, London, on Friday under the chairmanship of the President, Sir David Milne-Watson.

MAY AND BAKER, LTD., announce that the advance in the price of methylated spirit necessitates an increased rate of a penny per lb. on methylated ethers. Anaesthetic ether made from duty-free rectified spirit is not affected.

MR. F. E. HAMER (THE CHEMICAL AGE), at the annual meeting on Wednesday of the Montgomeryshire Society in London, was elected chairman of the society for the ensuing year, in succession to Mr. Clement Davies, K.C., M.P.

THREE WIDNES VETERANS of the chemical industry have recently passed away in Mr. Henry Rimmer (aged 74), for 44 years with the Widnes Alkali Works; Mr. J. H. Williams (aged 68), for 40 years chemical inspector at the Gaskell-Deacon Works, and Mr. S. Knight (aged 69), for 32 years with William Gossage and Sons.

THE CHEMICAL SOCIETY will hold an ordinary scientific meeting on Thursday next, when the following papers will be read: "The influence of a soluble fluoride on the corrosion of iron," by A. W. Chapman; "The application of a new type of triode valve to the determination of hydrogen ion concentration with glass electrodes," by G. B. Harrison; and "Properties of conjugated compounds. Part X. Variability in the mode of ester-addition to butadiene esters and ketones," by E. H. Farmer and T. N. Mehta.

MR. ARNOLD KERSHAW has received the degree of Doctor of Philosophy of London University for research carried out at Huddersfield Technical College under the direction of Dr. H. H. Hodgson, the head of the Chemistry Department. This success is the fifth of its kind to have been awarded to Dr. Hodgson's research students. The Chemical Research School of the Huddersfield Technical College, which has been recognised by the Department of Scientific and Industrial Research for several years past, has published 90 scientific papers during the past eight years.

THE USE OF SMOKE SCREENS and gas in naval warfare was described by Professor J. P. Kendall, of Edinburgh University, on Friday, May 23, in an address given at a joint meeting of the Institute of Chemistry and the Society of Chemical Industry at Edinburgh. The pre-war smoke screens, produced by belching forth black clouds from the funnels by incomplete combustion of fuel, were, he said, quite useless against submarine attack and rapidly dissipated. Several types of white smoke were evolved which proved much more durable and efficient. Toxic gas was not actually used in naval engagements during the war, but a considerable amount of research work had been done in developing satisfactory materials.

AMALGAMATED METAL CORPORATION, LTD., which holds all the shares of the British Metal Corporation, Ltd., and Henry Gardner and Co., Ltd., is reported to be about to effect a substantial exchange of shares with the Metallgesellschaft of Frankfurt. The object of the transaction is to secure co-operation in certain directions: whilst the provision of raw materials needed by the smelters and refineries associated with the two groups should be facilitated. It is intended that each company should have the right to representation on the board of the other. Negotiations are already in an advanced state to bring about a similar arrangement between Amalgamated Metal Corporation, Ltd., and the Société Générale des Minéraux of Brussels.

### Obituary

MAJOR SIR ASTON COOPER-KEY, director of Allen-Liversidge, Ltd., and the Service Petroleum Co., Ltd., and for many years Chief Inspector of Explosives at the Home Office, on May 28, aged 69.



## Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

### Abstracts of Accepted Specifications

327,026. UREA. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, April 15, 1929.

Ammonia and carbon oxysulphide are liquefied in an iron pressure vessel by cooling with liquid air, and then heated to 120° C. to obtain urea. Alternatively, ammonia may be liquefied, gaseous carbon oxysulphide added, and the mixture heated to 120° C.

327,047. POTASSIUM NITRATE. Kali-Forschungs-Anstalt Ges., 5, Schönebergerstrasse, Berlin. International Convention date, February 11, 1929.

Potassium chloride solution is treated with nitric acid, and potassium nitrate is separated. Potassium chloride may be added to the solution, which is then treated with nitric acid. Nitrosyl chloride is evolved, and may be adsorbed in silica gel, active carbon or ferric chloride, and then liberated by heating, and decomposed with lime, iron or ferrous chloride, and the nitric oxide used again.

327,087. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, March 25, 1929.

Dye preparations are made by mixing 3-60 parts by weight of a pure sulphonic acid of N-dihydro-1:2:2':1'-anthraquinone-azine obtained as described in Specifications Nos. 320,397 and 327,007 (See THE CHEMICAL AGE, Vol. XXI, p. 552, and Vol. XXII, p. 494) and 97-40 parts by weight of pure N-dihydro-1:2:2':1'-anthraquinone-azine or an unsulphonated derivative obtained as described in Specifications Nos. 184,193 and 322,277 (See THE CHEMICAL AGE, Vol. VII, p. 538 and Vol. XXII, p. 101).

327,094. SUBSTITUTES FOR LINOXYN AND RUBBER. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 17, 1928.

These products are obtained from the mixture of esters produced from glycerol, sorbitol or other polyhydric alcohol, and the unsaturated fatty acids obtained by splitting off water from oxidation products of paraffin hydrocarbons, waxes, etc. The esters may first be heated with a dryer, or a metal compound forming a dryer with the acids of the esters, and then with oxygen or gases containing it, or with a vulcanising agent. An inert organic diluent such as petroleum fractions, carbon disulphide, or carbon tetrachloride may be present. An example is given.

327,128. ANTHRACENE DERIVATIVES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 26, 1928.

1:4-naphtho-quinones partly or completely hydrogenated in the benzene nucleus are condensed with a 1:3-butadiene. Alternatively, benzoquinone is condensed with a 1:3-butadiene under mild conditions as described in Specification No. 324,661 (See THE CHEMICAL AGE, Vol. XXII, p. 329) and the product condensed with a different 1:3-butadiene. The products may be treated as described in Specification No. 320,375 (See THE CHEMICAL AGE, Vol. XXI, p. 552) to obtain anthraquinones and hydrogenated intermediate products. In an example, benzoquinone is condensed with 1:3-butadiene and the product condensed with 2:3-dimethyl-1:3-butadiene, and in another example 5:8-dihydro-1:4-naphthoquinone or 5:6:7:8-tetrahydro-1:4-naphthoquinone is condensed with 1:3-butadiene.

327,130. DYE INTERMEDIATES. I. Gubelmann, 1,202, Fairview Avenue, H. J. Weiland, 1,251, Fairview Avenue, and O. Stallmann, 819, Marquette Avenue, all in South Milwaukee, Wis., U.S.A. Application date, September 24, 1928.

4-sulpho-2-benzoyl-benzoic acid is nitrated at a relatively low temperature to obtain the corresponding 5-nitro compound, which is reduced, e.g., with iron and acetic acid, to obtain

4-sulpho-2-benzoyl-5-amino-benzoic acid. These compounds may be heated in concentrated sulphuric acid to obtain 2-nitro- (or amino-) anthraquinone-7-sulphonic acid. The latter may be treated with alkali chlorate to obtain 2-nitro-7-chloranthraquinone, which may be reduced with sodium mono- or disulphide, or glucose and caustic alkali, to obtain 2-amino-7-chloranthraquinone. 2-amino anthraquinone 7-sulphonic acid may be treated with ammonia in the presence of oxidising agents at a raised temperature to obtain 2:7-diaminoanthraquinone.

327,141. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 27, 1928.

Isodibenzanthrone and its derivatives are subjected to the action of hydroxyl-amine or its salts in the presence of inorganic dissolving or suspending media capable of splitting off water, such as sulphuric, phosphoric or chlorosulphonic acid, and condensing catalysts such as iron, copper, mercury or their compounds. Alkylating agents, acylating agents, or halogens or agents which split off halogens may also be present, or may be employed subsequently. The products are purified by boiling with organic solvents, or by way of their oxonium salts, or by treating their pastes with alkali metal hypochlorites. In examples, the above treatment is applied to isodibenzanthrone to obtain a product which dyes cotton dark blue shades which are more reddish if dimethyl sulphate is present in the condensation; dibromisodibenzanthrone to obtain a product which dyes cotton reddish-blue shades; dichlor-isodibenzanthrone to obtain a product which dyes in blue shades.

327,142. TIN, TITANIUM AND ZIRCONIUM OXIDES. Deutsche Gold-und-Silber-Scheideanstalt vorm. Roessler, 7, Weissfrauenstrasse, Frankfurt-on-Main, Germany, and L. Weiss, 20, Mittelweg, Frankfurt-on-Main, Germany. Application date, December 27, 1928.

Pigments and turbidity agents for vitreous enamels are obtained by treating soluble compounds of tin, titanium and zirconium, with or without limited quantities of solvents, with substances capable of converting them into oxides, such as alkaline lyes, steam or ammonia. The oxides or hydroxides obtained are converted into a voluminous form by heating to 500°-800° C. in the case of pigments, or 900°-1,500° in the case of turbidity agents. The reaction may take place in the vapour stage, in which case the subsequent heating may be omitted. Reference has been directed by the Comptroller to Specification No. 28,565/1908, 203,352, 206,284, and 296,730.

327,158. PHENOL FORMALDEHYDE CONDENSATION PRODUCTS. A. Carpmal, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 28, 1928.

Phenol-formaldehyde condensation products which are in the liquid soluble phase are mixed with polyalkylene-glycol-aryl-ethers or lower fatty acid esters of these. These derivatives are obtained by treating an aromatic hydroxy compound with several molecular proportions of an olefine oxide. The free hydroxy groups may be esterified by a lower fatty acid such as formic, acetic or propionic acid. The mixture of phenol-formaldehyde condensation products is then heated until the desired state of condensation is reached. Examples are given of the condensation of phenol-formaldehyde condensation products with polyethylene-glycol-cresyl-ether, polyethylene-glycol-cresyl-ether-acetate and polyethylene-glycol-cresyl-ether-formate.

327,162. WAXES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 24, 1928.

Montan wax bleached by oxidation or a conversion product still containing free carboxylic acids is esterified with a hydroxy-carboxylic acid of high molecular weight in the presence of sulphuric or hydrochloric acid. Free acids in the product may be converted wholly or partly into salts, esters, or other

omponents containing the-CO but not the-COOH group, *e.g.*, amides or anhydrides. Wax-like products are obtained and an example is given.

- 327,165. ESTERS OF POLYVALENT ALCOHOLS AND CARBOHYDRATES. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, November 22, 1928.

Compounds of the nature of polyvalent alcohols and having at least one free hydroxyl group, *e.g.*, glycerine or a carbohydrate such as sugar, starch, cellulose, or a low-esterified cellulose ester, or a cellulose monoether, are esterified with the aid of a condensation product obtained from a carboxylic halide by splitting off hydrogen halide. This may be done by an anhydrous metal chloride or a tertiary base such as triethylamine or pyridine. An indifferent diluent and a catalyst such as sulphuric acid, an acid chloride or zinc chloride may also be present. In an example, the compound obtained by shaking lauryl chloride with pyridine bases and removing the precipitated pyridine hydrochloride is allowed to react on cotton linters in the presence of chlorobenzene to obtain a cellulose laurate. Another example describes the treatment of glycerine with the condensation product obtained by shaking acetyl chloride with pyridine and filtering. The product consists of diacetin and triacetin. Other examples are given.

- 327,175. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 27, 1928. Addition to 303,184. (See THE CHEMICAL AGE, Vol. XX, p. 104).

Allo-ms-naphthodianthrone and their derivatives are halogenated by treating with chlorine or bromine or substances yielding them in inorganic acids at temperatures below 60° C. or in water or other inorganic suspending liquids, or with halogen without suspending liquid. In addition to acids, suspending media include melts of metal chlorides, inorganic halogenating agents such as sulphuryl chloride, phosphorus oxychloride with or without phosphorus pentachloride. Chlorine and bromine may also be present, and halogenating catalysts such as sulphur, iodine, mercury, bismuth, antimony, selenium, phosphorus, iron, manganese, nickel, tungsten or molybdenum. The products dye in orange-yellow to blue-red shades and may be purified by way of their oxonium salts, by recrystallisation, by sublimation, or by treating their aqueous pastes with oxidising agents. Examples are given of the treatment of allo-ms-naphthodianthrone with liquid bromine, bromine vapour or chlorine, phosphorus pentachloride and oxychloride. Also the treatment of mono-cyano-allo-ms-naphthodianthrone, monoamino-allo-ms-naphthodianthrone, monomethoxy-allo-ms-naphthodianthrone and diphenoxy-allo-ms-naphthodianthrone.

- 327,193. SUGARS AND POLYHYDRIC ALCOHOLS, MANUFACTURE OF. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 3, 1928.

Formaldehyde or a polymer is boiled with a catalyst such as lead oxide in the presence of a mono- or poly-hydric alcohol miscible with water. The catalyst is separated and the solvent evaporated to obtain the sugar as a clear syrup. Examples are given of the treatment of 30 per cent. aqueous formaldehyde, methyl alcohol and lead oxide; trioxymethylene, glycerol and lead oxide; and formaldehyde, methyl alcohol and lime. The sugars may be reduced catalytically to obtain polyhydric alcohols.

- 327,194. DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 3, 1928.

Crude benzol is freed from sulphur by treating with hydrogen at increased temperature and pressure, and this is combined with the destructive hydrogenation of other carbonaceous material. The crude benzol may be mixed with a middle oil or with coal or may be used to extract coal or destructive hydrogenation residues, the mixture being then treated with hydrogen. The temperature may be 380°-550° C. and the pressure up to 1,000 atmospheres. A catalyst may consist of molybdic acid, zinc oxide, magnesia and chromic acid. An example is given of the extraction with benzol of middle oil from the destructive hydrogenation of German brown coal, and subsequent treatment with hydrogen. The product is a

non-knocking motor fuel, and contains 60 per cent. of constituents boiling below 185° C. and less than 0.02 per cent. of sulphur.

- 327,224. CATALYTIC PRODUCTION OF ISOPROPYL ALCOHOL. G. F. Horsley, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, January 25, 1929.

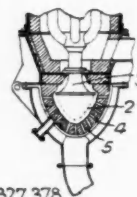
Acetone is hydrogenated in the vapour phase in the presence of a catalyst containing copper and/or silver and an oxide or hydroxide of a divalent metal such as iron, cobalt, nickel, zinc, calcium, strontium, barium, magnesium, chromium or manganese.

- 327,374. CARBON. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 19, 1928.

Unsaturated hydrocarbons are treated in the gaseous phase with a dehydrogenating catalyst consisting of a metal or compound of the iron group with or without other gases and vapours, at atmospheric or reduced pressure, at a low or moderate temperature, *e.g.*, 300°-450° C. Hydrocarbons treated include ethylene and its homologues, butadiene and its homologues, and acetylene and its homologues, and these may be derived from thermal decomposition or partial combustion of gaseous aliphatic hydrocarbons, *e.g.*, methane, ethane or propane, or gases containing them, *e.g.*, gas oils, benzines, gasolines, tars, mineral oils or residues. Various diluent gases may be used. Activating substances may be added to the catalyst, such as oxides, hydroxides or carbonates of cadmium, copper, vanadium, zinc, aluminium, uranium, thorium, chromium and manganese, caustic alkalies, alkaline earth oxides, or salts. Cobalt catalysts may be obtained by reducing cobalt compounds with hydrogen at a moderate temperature, and are particularly suitable for giving finely divided carbon black. In an example, ethylene is passed at a pressure of 1-10 atmospheres through a tube containing nickel balls heated to 500° C. Carbon black, hydrogen, and a little methane are obtained. Several other examples are given, and also examples of the use of the carbon black in a vulcanisation process.

- 327,378. CATALYTIC APPARATUS. Soc. Anon. D'Ougree Marihay, Ougree, Belgium. International Convention date, April 7, 1928.

The catalyst 2 or the member on which it is distributed is in the form of a surface of revolution of a catenary. The wall 5 surrounding the catalyst is of similar shape, and has a number



327,378

of discharge passages 4. The gases are admitted through a diffuser 3.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—305,592 (I.G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs of the indigo series, see Vol. XX, p. 384; 319,656 (I.G. Farbenindustrie Akt.-Ges.) relating to chemically pure phosphoric acid, see Vol. XXI, p. 534.

#### Specifications Accepted with Date of Application

- 303,838. Monoazo dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 10, 1928.  
305,488. Vat dyestuffs of the anthraquinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 3, 1928.  
305,588. Alkaline earth and alkali formates and chromium green, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 7, 1928.  
305,679. Vat dyestuffs of the benzanthrone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 10, 1928.  
305,931. Alkali hypochlorites from waste alkali lyes, Manufacture of. I. G. Farbenindustrie Akt.-Ges. February 11, 1928.

- 307,457. Catalytic ammonia synthesis. Selden Co. March 8, 1928.
- 306,035. Alloy. Siemens und Halske Akt.-Ges., and W. Kroll. February 14, 1928.
- 308,778. Iron, copper and their alloys, Protection of. G. Nobilleau and J. Guipet. March 28, 1928.
- 308,598. Phosphoric acid and hydrogen, Production of. Bayerische Stickstoff-werke Akt.-Ges. March 24, 1928.
- 309,175. Fertilisers. A. A. J. Vilain and C. A. A. Vilain. April 7, 1928.
- 309,949. Disubstituted tetrazoles, Preparation of. A. Boehringer. April 18, 1928.
- 310,468. Dephosphorising iron, Processes and apparatus for. P. Ries and F. Bicheroux. April 26, 1928.
- 310,861. Vat dyestuffs of the 3:4:8:9-dibenzpyrenequinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 2, 1928.
- 311,207. Alloys, Manufacture of. Deutsche Edelstahlwerke Akt.-Ges. May 8, 1928.
- 312,996. Iron and steel, Pickling of. Verein für Chemische und Metallurgische Produktion. June 4, 1928.
- 316,251. Oxidisable organic compounds. Goodyear Tire and Rubber Co. July 26, 1928.
- 328,933. Carbazole derivatives, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 5, 1929.
- 328,992. Destructive hydrogenation of coal, tars, mineral oils, and the like. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.). January 5, 1929.
- 328,993. Vat dyestuffs of the benzanthrone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 9, 1929. Addition to 4451 1929.
- 328,993. Phosphoric acid esters, Manufacture of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.). January 31, 1929. Addition to 300,044.
- 328,013. Clarification of liquids and the separation of finely powdered solid substances, Apparatus for. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.). February 7, 1929.
- 329,032. Dehydration. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.). February 15, 1929.
- 329,041. Amphoteric hydrated oxides of metals by hydrolysis. Baron Marks. (R. H. Monk and J. Irwin). February 18, 1929.
- 329,044. Feeding pastes of coal and oil or the like into hydrogenation converters. W. R. Tate, H. P. Stephenson, and Imperial Chemical Industries, Ltd. February 21, 1929.
- 329,045. Heating hydrogen for use in destructive hydrogenation. W. R. Tate, H. P. Stephenson, and Imperial Chemical Industries, Ltd. February 21, 1929.
- 329,049. Azo dyes, Manufacture of. Imperial Chemical Industries, Ltd., and R. Brightman. February 21, 1929.
- 329,056. Azo dyes, Manufacture of—and their application to the dyeing of regenerated cellulose materials. Imperial Chemical Industries, Ltd., and R. Brightman. February 25, 1929.
- 329,079. Ammonia, Synthetic production of. J. Y. Johnson (I.G. Farbenindustrie Akt.-Ges.). March 14, 1929.
- 329,135. Purification of gases. W. D'Leny, and Imperial Chemical Industries, Ltd. April 26, 1929.
- 329,145. Nitrate of lime, Production of. Appareils et Evaporateurs Kestner. April 3, 1929. Addition to 279,037.
- 329,176. Siemens-Martin furnaces. H. Wade. (Terni Soc. per l'Industria e l'Elettricità). May 24, 1929.
- 329,200. Nitrates, Production of. B. Uebler and Kalifornische-Anstalt Ges. June 17, 1929.
- 329,225. Lyes containing copper and zinc, Method of treating. N. E. Lenander and I. Ryen. July 13, 1929.
- 329,260. Carrying out reactions continuously in the liquid phase under increased pressure, Apparatus for. Imperial Chemical Industries, Ltd. October 29, 1928.
- 329,203. Halogen derivatives of the dibenzanthrone series, Production of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.). June 4, 1929.
- Brightman, R. Disazo-dyestuffs, and application thereof. 15,757 May 22.
- Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs containing copper. 15,388. May 19.
- Manufacture of fast vat dyestuffs. 15,937. May 23.
- Manufacture of vat dyestuffs of the pyranthrone series. 15,938. May 23.
- Cavadino, C. G. F. Treatment of magnesium, etc., silicates. 15,875. May 23.
- Chemische Fabrik Kalk Ges., and Oehme, H. Extraction of ethylene glycol, etc. 16,025. May 24.
- Commercial Solvents Corporation. Recovering dilute acids. 15,354. May 19. (United States, May 18, 1929.)
- Demant, J. E. Manufacture of chromium oxide. 15,843. May 22.
- Ges. für Kohlentechnik. Production of hydrocyanic acid. 15,806. May 22. (Germany, June 6, 1929.)
- Production of hydrocyanic acids, etc. 15,807. May 22. (Germany, June 7, 1929.)
- Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of meta-hydroxy-diarylamine-carboxylic acids. 15,493. May 20.
- Manufacture of arylides of aromatic hydroxy-carboxylic acids. 15,636. May 21.
- Manufacture of azo-dyestuffs insoluble in water. 15,947. May 23.
- Holzverkohlungs Industrie Akt.-Ges. Continuous production of esters of ethyl alcohol. 15,777. May 22. (Germany, July 23, 1929.)
- Honnay, C. Low-temperature distillation of carbonaceous materials. 15,958. May 23.
- I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Apparatus for manufacture of low-temperature carbonisation tar. 15,327. May 19.
- Manufacture of double salts. 16,065. May 24.
- Manufacture of sulphates from sulphites, etc. 16,066. May 24.
- Vaporisation of carbonaceous substances. 16,067. May 24.
- I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 15,627. May 21.
- Manufacture of arylides of aromatic hydroxy-carboxylic acids. 15,636. May 21.
- Apparatus for treatment of hydrocarbons, etc. 15,908. May 23.
- I.G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs of the thioindigo series. 15,376, 15,377. May 19. (Germany, May 18, 1929.)
- Continuous filter drum. 15,638. May 21. (Germany, May 21, 1929.)
- Determining photographic exposures. 15,948. May 23. (Germany, May 23, 1929.)
- Dyeing acetate silk. 15,951. May 23. (Germany, May 23, 1929.)
- Separation of sulphur from wash liquids. 16,055. May 24. (Germany, May 27, 1929.)
- I.G. Farbenindustrie Akt.-Ges., and Imray, O. Y. Manufacture of azo-dyestuffs insoluble in water. 16,064. May 24. (March 21, 1929.)
- Imperial Chemical Industries, Ltd. Production of dyestuffs, etc. 15,385. May 19.
- Cutting iron and steel by fusion. 15,615. May 21.
- Manufacture of coating-compositions, and application thereof. 15,616. May 21. (United States, May 21, 1929.)
- Imperial Chemical Industries, Ltd., and Paine, C. Polyoxy dyestuffs. 15,756. May 22.
- Disazo dyestuffs and application thereof. 15,757. May 22.
- Kane, T. Manufacture of alkyl chlorides, etc., for olefines, etc. 15,709. May 22.
- Naugatuck Chemical Co. Making styrols. 15,653. May 21.
- Naugatuck Chemical Co. Making tough styrol polymers. 15,652. May 21. (United States, May 24, 1929.)
- Röhm and Haas Co., and Triggs, W. W. Compounds of phenol and formaldehyde for tanning, etc. 15,511. May 20.
- Wetting, cleansing, etc., agents. 15,512. May 20.
- Scottish Dyes, Ltd., Thomas, J., and Wilson, J. S. Drolling cellulose acetate. 15,819. May 22. (November 27, 1928.)
- Shaw, C. Smith, W., Thomas, J., and R. Fraser-Thomson. Production of dyestuffs, etc. 15,385. May 19.
- Soc. of Chemical Industry in Basle. Obtaining concentrated sulphur dioxide. 14,988. May 15. (Switzerland, May 15, 1929.)
- Manufacture of basic ethers of aryl-quinolines. 15,099. May 16. (Switzerland, May 16, 1929.)
- Strange, E. H. Manufacture of alkyl chlorides, etc., from olefines, etc. 15,709. May 22.
- Triggs, W. W., and Wülfing, J. A. Manufacture of dithium alkali citrates. 15,251. May 17.

#### Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

- Bentley, W. H., Coates, W. M., and J. Riley and Sons, Ltd. Manufacture of sulphonated castor oil. 16,024. May 24.
- Bloxam, A. G., and Soc. of Chemical Industry in Basle. Manufacture of cellulose esters. 15,494. May 20.
- Boehringer and Soehne, Ges. C. F. Preparation of acetic anhydride, etc. 15,798. May 22.



## Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

### General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.  
 ACID, CHROMIC.—Is. 0½d. per lb. d/d U.K.  
 ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.  
 ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.  
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.  
 AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.  
 AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K.  
 BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.  
 BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.  
 BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)  
 CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.  
 CHROMIUM OXIDE.—9½d. and 10½d. per lb. according to quantity d/d U.K.  
 CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 15s. per ton d/d U.K.  
 COPPER SULPHATE.—£25 to £25 10s. per ton.  
 METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases.  
 NICKEL SULPHATE.—£38 per ton d/d.  
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.  
 POTASH CAUSTIC.—£30 to £33 per ton.  
 POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.  
 POTASSIUM CHLORATE.—3½d. per lb., ex-wharf, London, in cwt. kegs.  
 POTASSIUM CHROMATE.—8½d. per lb. d/d U.K.  
 SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.  
 SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.  
 SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.  
 SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.  
 SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.  
 SODIUM ACETATE 97/98%.—£21 per ton.  
 SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.  
 SODIUM BICHROMATE CRYSTALS.—3½d. per lb. nett d/d U.K. spot. Anhydrous ½d. per lb. extra.  
 SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.  
 SODIUM CHLORATE.—2½d. per lb.  
 SODIUM CHROMATE.—3½d. per lb. d/d U.K.  
 SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.  
 SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.  
 SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.  
 SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.  
 SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d in drums. Crystals—Spot, £7 10s. per ton d/d station in sellers' casks.  
 SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station. in returnable casks.

### Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 7½d. per lb. Crude 60's, 2s. 3d. to 2s. 5d. April-June, 2s. 2d. July-Dec. per gall.  
 ACID CRESYLIC 99/100.—2s. 2d. to 2s. 6d. per gall. Pure, 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. to 2s. 2d. Dark, 95%, 1s. 9d. Refined, 2s. 7d. to 2s. 10d. per gall.  
 ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.  
 ANTHRACENE OIL, STRAINED, 1080/1090.—4½d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).  
 BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.  
 TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Firm. Pure, 1s. 11d. to 2s. 3d. per gall.  
 XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6½d. to 7d. per gall.; Heavy, for Export, 6½d. to 6¾d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.  
 NAPHTHA.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/100, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/100, 1s. 4d. to 1s. 6d. per gall. Solvent 90/100, 1s. to 1s. 2½d. per gall.  
 NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £4 10s. per ton. Hot pressed, £8 per ton.  
 NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton, according to districts.  
 PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.  
 PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

### Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.  
 ACID ANTHRANILIC.—6s. per lb. 100%.  
 ACID BENZOIC.—1s. 8½d. per lb.  
 ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.  
 ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.  
 ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.  
 ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.  
 ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.  
 ANILINE OIL.—Spot, 8½d. per lb., drums extra, d/d buyer's works.  
 ANILINE SALTS.—Spot, 8½d. per lb. d/d buyer's works.  
 BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.  
 BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.  
 BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.  
 o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.  
 m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.  
 p-CRESOL 34° 5' C.—1s. 9½d. per lb., in ton lots d/d.  
 DICHLORANILINE.—1s. 10d. per lb.  
 DIMETHYLANILINE.—Spot, 1s. 9½d. per lb., drums extra d/d buyer's works.  
 DINITROBENZENE.—8d. per lb.  
 DINITROCHLOROBENZENE.—£74 per ton d/d.  
 DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb.  
 DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.  
 α-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.  
 β-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.  
 α-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.  
 β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.  
 o-NITRANILINE.—5s. 11d. per lb.  
 m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.  
 p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.  
 NITROBENZENE.—Spot, 6½d. per lb. 5-cwt. lots, drums extra, d/d buyer's works.  
 NITRONAPHTHALENE.—9d. per lb.  
 R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.  
 SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.  
 o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.  
 p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.  
 m-XYLIDINE ACETATE.—3s. 1d. per lb. 100%.  
 N. W. ACID.—4s. 9d. per lb. 100%.

### Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.  
 ACETONE.—£78 per ton.  
 CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.  
 IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.  
 WOOD CREOSOTE.—1s. 9d. per gall., unrefined.  
 WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.  
 WOOD TAR.—£3 10s. to £4 10s. per ton.  
 BROWN SUGAR OF LEAD.—£38 per ton.

### Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.  
 ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.  
 BARYTES.—£5 10s. to £7 per ton, according to quality.  
 CADMIUM SULPHIDE.—5s. to 6s. per lb.  
 CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.  
 CARBON BLACK.—4½d. to 4½d. per lb., ex wharf.  
 CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.  
 DIPHENYLGUANIDINE.—3s. 6d. per lb.  
 LITHOPONE, 30%.—£20 to £22 per ton.  
 SULPHUR.—£9 10s. to £13 per ton, according to quality.  
 SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.  
 SULPHUR PRECIP. B.P.—£55 to £60 per ton.  
 ZINC SULPHIDE.—8d. to 11d. per lb.

### Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.  
 ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.  
 ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.  
 ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.  
 ACID, CAMPHORIC.—19s. to 21s. per lb.  
 ACID, CITRIC.—1s. 6½d. to 1s. 7½d. per lb., less 5%.  
 ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.  
 ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.  
 ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.  
 ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.  
 ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.  
 ACID, TARTARIC.—1s. 2½d. per lb., less 5%.  
 ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.  
 AMIDOL.—7s. 6d. to 9s. per lb., d/d.  
 AMIDOPYRIN.—7s. 9d. to 8s. per lb.  
 AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.  
 AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed, 1s. per lb.  
 AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.  
 ATROPHINE SULPHATE.—9s. per oz.  
 BARBITONE.—5s. 9d. to 6s. per lb.  
 BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.  
 BISMUTH CARBONATE.—7s. 6d. per lb.  
 BISMUTH CITRATE.—7s. 6d. per lb.  
 BISMUTH SALICYLATE.—7s. 3d. per lb.  
 BISMUTH SUBNITRATE.—6s. 6d. per lb.  
 BISMUTH NITRATE.—Cryst. 5s. per lb.  
 BISMUTH OXIDE.—9s. 6d. per lb.  
 BISMUTH SUBCHLORIDE.—9s. 9d. per lb.  
 BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.  
 BISMUTH ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 11½d. per lb.; 12 W. Qts. 10d. per lb.; 36 W. Qts. 9d. per lb.  
 BORAX B.P.—Crystal, £21 per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.  
 BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 4½d. to 1s. 5½d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.  
 CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1-cwt. lots.  
 CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.  
 CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.  
 CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.  
 CREOSOTE CARBONATE.—6s. per lb.  
 ETHERS.—S.G. 730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.  
 FORMALDEHYDE 40%.—37s. per cwt., in barrels, ex wharf.  
 GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.  
 HEXAMINE.—2s. 3d. to 2s. 6d. per lb.  
 HOMATROPINE HYDROBROMIDE.—30s. per oz.  
 HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.  
 HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.  
 HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.  
 HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.  
 IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb. U.S.P., 2s. 4d. to 2s. 7d. per lb.  
 IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.  
 IRON QUININE CITRATE.—B.P., 8½d. to 8½d. per oz., according to quantity.  
 MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.  
 MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.  
 MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net; Synthetic, 9s. 6d. to 11s. 9d. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.  
 MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive

Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.  
 METHYL SULPHONAL.—18s. 6d. to 20s. per lb.  
 METOL.—9s. to 11s. 6d. per lb. British make.  
 PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.  
 PARALDEHYDE.—1s. 4d. per lb.  
 PHENACETIN.—3s. 8½d. to 4s. 1d. per lb.  
 PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.  
 PHENOLPHTHALEIN.—5s. 6d. per lb.  
 POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—95s. per cwt., less 2½ per cent.  
 POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.  
 POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs  
 POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.  
 POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.  
 POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.  
 QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins  
 RESORCIN.—2s. 10d. to 3s. per lb., spot.  
 SACCHARIN.—43s. 6d. per lb.  
 SALOL.—2s. 3d. to 2s. 6d. per lb.  
 SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.  
 SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX.—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.  
 SODIUM FERROCYANIDE.—4d. per lb., carriage paid.  
 SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.  
 SODIUM NITROPRUSSIDE.—16s. per lb.  
 SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 2s. 6d. per cwt. extra.  
 SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.  
 SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.  
 SODIUM SULPHIDE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.  
 SULPHONAL.—9s. 6d. to 10s. per lb.  
 TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.  
 THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

### Perfumery Chemicals

ACETOPHENONE.—7s. per lb.  
 AUBEPINE (EX ANETHOL).—12s. per lb.  
 AMYL ACETATE.—2s. 6d. per lb.  
 AMYL BUTYRATE.—5s. per lb.  
 AMYL CINNAMIC ALDEHYDE.—12s. per lb.  
 AMYL SALICYLATE.—3s. per lb.  
 ANETHOL (M.P. 21/22° C.).—6s. 6d. per lb.  
 BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.  
 BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.  
 BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.  
 BENZYL BENZOATE.—2s. 6d. per lb.  
 CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.  
 COUMARIN.—12s. per lb.  
 CITRONELLOL.—10s. per lb.  
 CITRAL.—8s. per lb.  
 ETHYL CINNAMATE.—6s. 6d. per lb.  
 ETHYL PHTHALATE.—2s. 9d. per lb.  
 EUGENOL.—9s. 6d. per lb.  
 GERANIOL (PALMAROSA).—20s. per lb.  
 GERANIOL.—7s. 6d. to 10s. per lb.  
 HELIOTROPINE.—6s. 6d. per lb.  
 ISO EUGENOL.—11s. 9d. per lb.  
 PHENYL ETHYL ACETATE.—11s. per lb.  
 PHENYL ETHYL ALCOHOL.—9s. per lb.  
 RHODINOL.—46s. per lb.  
 SAFROL.—2s. per lb.  
 TERPINEOL.—1s. 6d. per lb.  
 VANILLIN, EX CLOVE OIL.—13s. 6d. to 15s. per lb. Ex Guaiacol, 12s. 6d. to 13s. 9d. per lb.

### Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.  
 ANISE OIL.—4s. 6d. per lb.  
 BERGAMOT OIL.—10s. 6d. per lb.  
 BOURBON GERANIUM OIL.—20s. per lb.  
 CAMPHOR OIL, WHITE.—160s. per lb.  
 CANANGA.—Java, 9s. 6d. per lb.  
 CASSIA OIL, 80/85%.—4s. 9d. per lb.  
 CINNAMON OIL LEAF.—7s. 9d. per oz.  
 CITRONELLA OIL.—Java, 2s. 7d. per lb., c.i.f. U.K. port.

## London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions

London, May 29, 1930.

MARKETS have been a little brighter during the last few days, and rather a large volume of business has been transacted. Prices with one or two exceptions continue steady, and there is little alteration to report. Export business is fairly satisfactory.

### General Chemicals

**ACETONE.**—There has been a fair amount of business placed and prices are unchanged at £71 10s. to £80 per ton, according to quantity.

**ACID ACETIC.**—Prices continue firm at £36 10s. for 80% technical and £37 10s. per ton for 80% edible. A steady demand is being received and the market is firm.

**ACID CITRIC.**—There is still only a quiet demand for this product, and prices, although showing no further decline, are still somewhat unsteady. Current prices at 1s. 7d. to 1s. 7½d. per lb., less 5%.

**ACID LACTIC.**—Rather more business has been booked for the technical grades, which is maintained at £42 per ton for 50% by weight pale quality.

**ACID OXALIC.**—Firm, with rather an increased consumption. Present prices being £30 7s. 6d. to £32 per ton, according to quantity.

**ALUMINA SULPHATE.**—Steady conditions control this market with a steady demand at £8 to £8 15s. per ton for 17/18% iron free quality.

**ARSENIC.**—Demand is still restricted and price is now somewhat steadier at £15 15s. per ton, free on rails at the mines.

**CREAM OF TARTAR.**—Prices are unchanged at 95s. per cwt., ex wharf London, with the demand increasing.

**COPPER SULPHATE.**—Prices after being a little easier are now firmer, and there is a considerable demand on the market for early shipment. Current prices are firm at £21 10s. to £22 per ton, free on rails at London.

**FORMALDEHYDE.**—An increased demand has been received during the past week, and price is steadier at about £33 10s. per ton.

**LEAD ACETATE.**—Now more settled at £40 5s. per ton for white and £39 5s. for brown, with demand increasing.

**LEAD NITRATE.**—Prices have been reduced to conform to the lower levels of the metal and current prices are now £30 to £32 per ton, according to quantity.

**LITHOPONE.**—The market shows no change at £19 15s. to £23 per ton, according to grade and quantity, and there is a regular demand.

**CARBONATE OF POTASH.**—The market continues steady at £27 per ton for the 96/98% arsenic free quality, and there is a fair demand.

**PERMANGANATE OF POTASH.**—Unchanged and in steady request at 5½d. per lb. for the B.P. quality.

**SODIUM BICHROMATE.**—Receiving a good demand, and prices are being held at 3½d. per lb.

**SODA HYPOSULPHITE.**—An increased demand is being received for the photographic crystals, with prices firm at £14 15s. per ton, with commercial quality in rather slow demand at about £8 10s. to £9 per ton.

**SODIUM SULPHIDE.**—Without change, and there is a regular business passing.

**TARTAR EMETIC.**—In rather slow demand, with the price unchanged at 11d. per lb.

**ZINC SULPHATE.**—Firm at about £12 10s., with an increased demand.

### Coal Tar Products

Prices of coal tar products still remain firm, and stocks are gradually diminishing. There is a slightly better inquiry for the majority of the products.

**MOTOR BENZOL.**—Still firm at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

**SOLVENT NAPHTHA.**—Remains at about 1s. 2½d. to 1s. 3d. per gallon, f.o.r.

**HEAVY NAPHTHA.**—Unchanged at about 1s. 1d. per gallon, f.o.r.

**CREOSOTE OIL.**—Quoted at 3d. to 3½d. per gallon, f.o.r., in the north, and at 4d. to 4½d. per gallon in London.

**CRESYLIC ACID.**—Unchanged at 2s. per gallon for the 98/100% quality, and at 1s. 10d. per gallon, ex works, for the dark quality, 95/97%.

**NAPHTHALENE.**—The firelighter quality is quoted at £3 10s. to £3 15s. per ton, the 74/76 quality at £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

**PITCH.**—The average price over the past month has been ascertained as having been 44s. 6d. per ton, f.o.b. East Coast port.

We have received the following additional prices:—

**Carbolic Acid.**—Generally speaking, prices are unchanged at 7d. to 7½d. per lb., though business is quiet.

**Cresylic Acid.**—Pale 98% is quoted at 2s. per gallon, Refined 2s. 7d. to 2s. 10d. per gallon.

**Vanillin.**—From clove oil, in cwt. lots, is 14s. per lb. Smaller quantities 14s. 3d. to 14s. 6d. per lb.

**Pyridine 90/100.**—Quoted at 3s. 9d. to 4s. per gallon; quiet.

**Sodium Salicylate B.P.**—No change.

**Motor Benzol.**—1s. 7d. per gallon.

### Nitrogen Fertilisers Prices

**SULPHATE OF AMMONIA.—Export.**—It is reported from the United States that there has been a considerable drop in the internal price of ammonium sulphate, but on account of the tariff in operation there, this has had no effect other than psychological, on the world's market price. At present sellers are holding for £7 15s. per ton f.o.b. U.K. port in single bags, but buyers tend to hold off. In some quarters a further drop in price is expected. *Home.*—The interest in the home market has largely subsided. A few buyers are inquiring for forward positions but up to the present there seems no indication of what the price will be.

**NITRATE OF SODA.**—Except for a considerable drop in the United States price, there is no change to report. Sales in consuming countries show the normal decline at the end of the consuming season.

### Latest Oil Prices

**LONDON, May 28.**—LINSEED OIL was firm, and 2s. 6d. per ton higher. Spot, ex mill, £42 10s., nominal; June, £39 15s.; July-August, £39 2s. 6d.; and September-December, £37 10s., naked. RAPE OIL was inactive. Crude extracted, £37; technical refined, £38 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian, crude, £29; refined common edible, £34; and deodorised, £36, naked, ex mill. TURPENTINE was inactive, and 3d. per cwt. lower. American, spot, and June, 39s.; July-December, 40s.; Russian, spot, 30s. 6d.

**HULL.**—LINSEED OIL.—Spot and May, £42; June, £40 17s. 6d.; July-August, £39 12s. 6d.; September-December, £38 10s. per ton, naked. COTTON OIL.—Egyptian crude, spot, £29; edible refined, spot, £31 10s.; technical, spot, £31 5s.; deodorised, spot, £33 10s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent, spot, £31 per ton, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £32; deodorised, spot, £36 per ton. SOYA OIL.—Extracted and crushed, spot, £29 10s.; deodorised, spot, £33 per ton. RAPE OIL.—Crushed/extracted, spot, £36 10s.; refined, spot, £38 10s. per ton. TURPENTINE, CASTOR OIL, and COD OIL unchanged.

### Scottish Coal Tar Products

• WITH, perhaps, the exception of refined tar there is very little movement in the Scottish tar products market at the present time. Fortunately stocks are comparatively low, which is keeping values reasonably steady.

**Cresylic Acid.**—While orders are scarce, values remain steady. Pale 99/100%, 1s. 10½d. to 1s. 11½d. per gallon; pale 97/99%, 1s. 9½d. to 1s. 10½d. per gallon; dark 97/99%, 1s. 8½d. to 1s. 9½d. per gallon; high boiling, 1s. 9d. to 1s. 11d. per gallon; all f.o.r. makers' works.

**Carbolic Sixties.**—The value is nominal at about 2s. 4d. to 2s. 6d. per gallon. The production in this area continues very small.

**Creosote Oil.**—Makers are in a more comfortable position than they were a few weeks ago. Owing to the demand for road tar the production of oil is reduced meantime. Specification oil, 3d. to 3½d. per gallon; gas works ordinary, 3d. to 3½d. per gallon; washed oil, 3½d. to 3¾d. per gallon; all ex works in bulk.

**Coal Tar Pitch.**—The value is nominal at 47s. 6d. per ton f.a.s. Glasgow for export. There is very little demand in the home market and quotations are about 50s. per ton f.o.r. works.

**Blast Furnace Pitch.**—The controlled prices remain at 30s. per ton f.o.r. works for home trade and 35s. per ton f.a.s. Glasgow for export.

**Refined Coal Tar.**—Orders are increasing and quotations are steady at 3½d. to 4d. per gallon f.o.r. makers' works naked.

**Blast Furnace Tar.**—2¾d. per gallon ex works.

**Crude Naphtha.**—With the increased production at this season value is easy at 4d. to 4½d. per gallon f.o.r. works.

**Water White Products.**—90/100 solvent is better at 1s. 3d. to 1s. 4d. per gallon but 90/100 heavy is still 1s. to 1s. 1d. per gallon. Motor benzole is firm at 1s. 6½d. to 1s. 6¾d. per gallon.



## Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, May 28, 1930.

THE Scottish heavy chemical market has during the past week shown a marked improvement, and it is hoped that this will continue. Numerous inquiries have been received both for home and export business. Prices on the whole are fairly steady.

### Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports. 80% pure, £37 10s. per ton, ex wharf. 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80% QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at the same price, viz.: 3½d. per lb., ex store. Offered from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f., U.K. ports. Crystal Meal about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 88°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f., U.K. ports.

ANTIMONY OXIDE.—Rather easier and spot material now obtainable at round about £34 per ton, ex wharf. On offer for prompt shipment from China at about £30 per ton, c.i.f., U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f., U.K. ports. For Continental material our price would be £10 per ton, f.o.b., Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacture contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £35 per ton, ex store. Continental material now on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material, quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2% delivered.

POTASSIUM BICHRONATE.—Quoted 3½d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—99½/100% Powder. Quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIAN (YELLOW).—Spot material quoted at 7d. per lb., ex store. Offered for prompt delivery from the continent at about 6½d. per lb., ex wharf.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station, M.W. quality 30s. per ton less.

SODIUM BICHRONATE.—Quoted 3½d. per lb., delivered buyer's premises with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay minimum four-ton lots with various reductions for contracts.

SODIUM CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums; £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums; £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' stations, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £10 2s. per ton, carriage paid buyers' sidings, minimum five-ton lots, but demand in the meantime is small.

SODIUM PRUSSIAN.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered for unground quality. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid, 61/62%, £9 15s.; broken, 60/62%, £10 15s. per ton; crystals, 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC.—Chloride 98%.—British material offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

### South Wales By-Products

SOUTH WALES by-product activities remain moderate. Pitch continues to be a quiet feature, the demand being small and sporadic, with prices nominal round about the 47s. per ton mark. Creosote remains inactive with prices ranging from 2½d. to 3½d. per gallon. Road tar has a moderate call with quotations steady at from 14s. to 15s. per 40-gallon barrel. Motor benzol has a slightly better demand at from 1s. 4d. to 1s. 6d. per gallon. Refined tars are brighter, values for both coke oven and gasworks tar being unchanged. Heavy naphtha has only a small demand at from 11d. to 1s. 1d. per gallon, but solvent has a moderate call round about 1s. 3d. to 1s. 5d. per gallon. Sulphate of ammonia has practically no demand. Patent fuel and coke exports are unsatisfactory. Patent fuel prices for export are:—22s., ex-ship Cardiff; 21s., ex-ship Newport, and from 20s. to 21s., ex-ship Swansea. Coke prices for export are: 36s. to 37s. best foundry; 30s. to 32s. 6d. good foundry, and 25s. to 27s. 6d. for furnace. Oil imports during the month ending May 20th amounted to 15,283,680 gallons.

### Swiss Chemicals and Dyestuffs Progress

IN the annual report of the Society of Chemical Industry in Basle satisfactory progress is recorded. The gross profits for 1929 were 6,023 million francs and the net profits 3,764 million francs, as compared with 3,664 in 1928. A dividend of 17 per cent. was declared. Despite the keenest competition in dyestuffs, sales further increased during 1929. The works at Basle were fully occupied the whole year. Synthetic indigo sales fell off owing to the keen competition in the Chinese market. The Clayton Aniline Co. of Manchester (the English subsidiary company) made further progress both in output and sales and it is intended to extend the plant of this company in the near future. Good results were shown by the American and Italian subsidiary companies and the Hydro-Nitro S.A. in Geneva, formed for the exploitation of processes and discoveries in the heavy chemical industry, has had a satisfactory year.

## Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, May 29, 1930.

MIXED conditions still obtain on the chemical market locally, and although for some descriptions the demand is maintained at a fair level the majority are moving only in small to moderate quantities, the demand from the textile finishing and allied industries being restricted in accordance with the slow rate of cotton trade operations. With regard to prices, the general tendency seems still towards continued steadiness, but in more than one section of the market during the past week varying shades of weakness have been in evidence.

### Heavy Chemicals

Business in chlorate of soda this week has been of quiet dimensions, with current values at about £25 per ton. A quietly steady trade is going through in the case of caustic soda, prices of which for contract deliveries are well maintained at from £12 15s. to £14 per ton, according to quality. Bichromate of soda keeps steady and a moderate inquiry in this section is reported; quotations are at 3½d. per lb., less 1 to 2½ per cent., according to quality. A quiet business is passing in hyposulphite of soda, prices of which are well held at about £9 per ton for the commercial kind and £15 10s. for the photographic. Alkali is moving in fair quantities and prices are quite steady at about £6 per ton, similar conditions obtaining in the case of bicarbonate of soda, which is quoted at £10 10s. per ton in contracts. Enquiry for sulphide of sodium since last report has been on quiet lines but offers are fully maintained, the 60-65 per cent. concentrated solid material being obtainable in the neighbourhood of £10 per ton and the commercial grade at £8. There is no special feature about the demand for saltcake, but values of this are well held at up to £3 per ton. Phosphate of soda keeps fairly steady, although no great weight of business is being put through; current quotations on this market for the dibasic material range from about £11 to £11 10s. per ton.

Among the potash compounds, a relatively slow trade is passing in carbonate and at from £25 to £25 10s. per ton further easiness has been shown. Yellow prussiate of potash is fully maintained at from 6¾d. to 7¼d. per lb., according to quantity, and a fair demand in this section is reported. Chlorate of potash is quiet and still on the easy side, with current offers at round £26 per ton. A quiet trade is going through in respect of caustic potash, values of which are about unchanged on balance at £31 per ton. Bichromate of potash is reasonably steady on the basis of 4¾d. per lb., and a fair amount of buying interest is being shown. There has been little change in permanganate prices and sales of this material are still on a moderate scale; the commercial crystals are obtainable at about 5¼d. per lb. and the B.P. quality at 5½d.

Continued uncertainty in the copper market is exerting its influence on sulphate, quotations for which this week have been rather uncertain at from £24 10s. to £25 per ton, f.o.b. Arsenic meets with only a comparatively quiet demand, with prices unchanged compared with last report at from £15 10s. to £15 15s. per ton, on rails, for white powdered, Cornish makes. Business in acetate of lime is on the slow side, but values are about maintained at round £15 per ton for the grey quality and £7 10s. for the brown. The lead products are quiet and easy, with nitrate offering at from £29 to £30 per ton, and white and brown acetate at £37 and £36.

### Acids and Tar Products

A fair demand is being experienced in the case of acetic acid and prices are very firm at round £36 10s. per ton for the commercial 80 per cent. material and £66 for the glacial. Further easiness has been displayed in both tartaric and citric acids, small sales being reported at 1s. 2½d. and from 1s. 8d. to 1s. 8¼d. per lb., respectively. There has been no change in the price position of oxalic acid, enquiry being on moderate lines with offers £1 12s. per cwt., ex store.

Pitch is a quiet section of the by-products market, with prices largely nominal at 47s. 6d. per ton, f.o.b. Crystal carbolic acid is slow but unchanged at round 7¼d. per lb., f.o.b., with 60's crude steady and in fair demand at 2s. 5d. to 2s. 6d. per gallon, naked. There is some enquiry about for creosote oil, offers of which are at 3d. to 4¼d. per gallon, naked. Solvent naphtha is in quiet demand but prices are unchanged at 1s. 2d. per gallon.

## Company News

**NORTH BROKEN HILL.**—A dividend of 1s. 6d. per share is recommended, payable on June 30.

**YORKSHIRE DYEWARE AND CHEMICAL CO.**—After providing for depreciation of property, plant and machinery, and all other charges and directors' fees, the surplus for the year ended March 31, 1930, amounts to £17,876, and the amount brought forward is £1,425. Interest on debenture stock, less tax, takes £4,072, and the directors recommend a dividend at the rate of 7½ per cent., making 10 per cent. for year, less tax at 4s. 6d. in the £, carrying forward £3,510.

**W. J. BUSH AND CO.**—The accounts for the year ended December 31, 1929, show a gross profit of £229,043. After providing for debenture interest, expenses, and directors' remuneration, and making allowances for depreciation, there is a net profit of £42,825. To this must be added £60,367, the amount brought forward, making £103,192. The directors recommend payment of final dividend of 4 per cent. on ordinary shares, making 8 per cent. for the year, and carrying forward £69,192.

**BOOTS PURE DRUG CO.**—A reduction in profits of £25,284 for the year ended March 31, 1930, is reported in a preliminary announcement. Subject to completion of audit, the profits amounted to £724,868, as against £750,152 last year. Four quarterly dividends of 6 per cent., less tax, have already been paid, making 24 per cent., less tax, and the directors now announce that a bonus of 1s. per share, free of tax, will be paid, making the same distribution as last year. Last year £200,000 was taken to reserve and £226,709 carried forward.

**BRITISH OIL AND CAKE MILLS.**—A net profit for 1929 of £583,331 is reported against £610,885 for 1928. With £30,879 brought in, there is available £614,210, against £645,377. The preference dividend takes £40,871, and preferred again receive the maximum of 12½ per cent., less tax. The ordinary dividend is reduced from 6 per cent. to 3 per cent., less tax, leaving an increased balance of £104,711 to go forward. The report states that during the first nine months of the year business was satisfactory and reasonably profitable, but the subsequent unexpected collapse in cereal values had the inevitable reaction on consumption and the price of cakes. In view of continued depreciation in stock values during succeeding months, the board has decided to carry forward a substantial balance in profit and loss account.

## Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

**CANADA.**—Manufacturers of mops and jobbers in mop yarns, oils and soaps, which they sell to the wholesale trade and to manufacturers in the Provinces of Ontario and Quebec, desire to obtain the representation, on a purchase basis, of British makers of linseed oil, soap, soda and soda ash. Ref. No. 433.

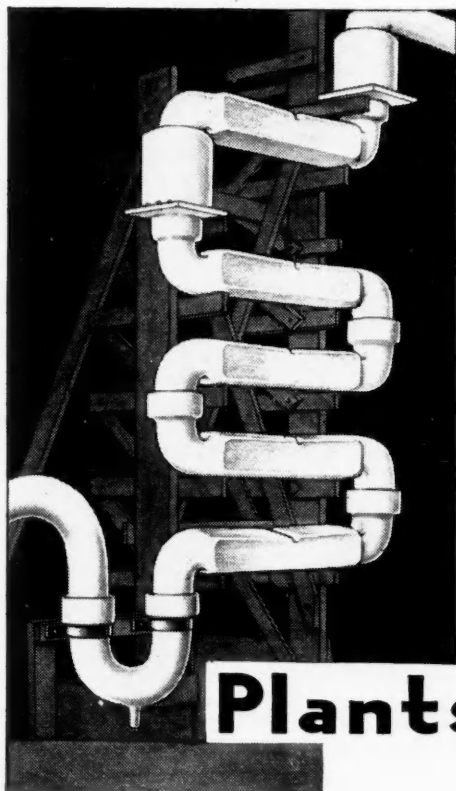
**EGYPT.**—The Egyptian Equipment and Finance Department, Ministry of the Interior, is calling for tenders, to be presented by June 16, for the supply and delivery of photographic chemicals, plates, paper and films, etc., for the year 1930-31. Re. No. B.X. 6,429.

## Tariff Changes

**BRITISH HONDURAS.**—An Order published on April 9 provides for the duty-free import into the Colony of insecticides used for spraying.

**FINLAND.**—Collodion cotton (nitrocellulose) in solution, which is imported by manufacturers for the prepatation of lacquer varnishes is to pay 4 Fm. kilog instead of 12 Fm.

**GUADELOUPE.**—An import duty of 2 per cent. *ad valorem* is to be imposed on organic nitrogenous, but the proposal to apply it to chemical fertilisers has been rejected.



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## New Chemical Trade Marks

### Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 14, 1930.

498,610. Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. Robert Skirving Brown, 36, Manor House, Marylebone Road, London, N.W.1; manufacturer. January 2, 1929.

#### NIVOSAL.

504,297. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including salts for making nickel solutions, and not including any goods of a like kind to these excluded goods. I.G. Farbenindustrie Aktiengesellschaft (a corporation organised under the laws of Germany), 28, Mainzer Landstrasse, Frankfurt-on-the-Main, Germany; manufacturers. July 8, 1929. To be associated with No. 504,298 (2,686) 1.



Registration of this trade mark shall give no right to the exclusive use of the word "Ici" or of the letters "I.C.I."

507,717. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Imperial Chemical Industries, Limited, Imperial Chemical House, Millbank, London, S.W.1. November 12, 1929. To be associated with No. 507,718 (2,720) ii and others.

507,718. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. Imperial Chemical Industries, Limited, Imperial Chemical House, Millbank, London, S.W.1. November 12, 1929. To be Associated with No. 507,717 (2,720) i and others.

507,719. Class 3. Chemical substances prepared for use in medicine and pharmacy. Imperial Chemical Industries, Limited, Imperial Chemical House, Millbank, London, S.W.1. November 12, 1929. To be Associated with No. 507,717 (2,720) i and others.

#### MYO-SALVARSAN.

501,517. Class 3. Chemical substances prepared for use in medicine and pharmacy. I.G. Farbenindustrie Aktiengesellschaft, (a corporation organised according to German laws), 28, Mainzer-Landstrasse Frankfurt-on-Main, Germany, manufacturers; and Bayer Products, Limited, 19, St. Dunstan's Hill, London, E.C.3; merchants. April 5, 1929. To be Associated with No. 310,235 (1,623) and another.

### "Restored" German Patents

UNDER date May 17, the Board of Trade have made an Order revoking their Order of July 19, 1920 (S.R. and O., 1920, No. 1336), which imposed certain conditions and restrictions upon dealings in "restored" German patents. The effect of this Order is to render it unnecessary in the future to obtain the consent of the Board of Trade to any dealings in such patents.

The Order also preserves any existing licences or assignments under these patents which may have been granted or approved under the "War" or Treaty of Peace legislation, but any royalties or other sums hitherto payable to the Controller of the Clearing Office and accruing from May 17 may be paid to the patentee.

A further Order of the same date revokes the Patent (Treaty of Peace) Rules, 1920 (S.R. and O., 1920, No. 1371).

Copies of these Orders may be consulted in the Public Library of the Patent Office, or may be purchased directly from H.M. Stationery Office, Adastral House, Kingsway, London, W.C.2, or through any bookseller.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

DEREK MANUFACTURING CO., LTD., 40, Chancery Lane, W.C., chemists. (C.C., 31/5/30.) £20 11s. 5d. March 19.

LAYLAND, Johnson (trading as Laylands), 505, Rochdale Old Road, Jericho, Bury, manufacturing chemist. (C.C., 31/5/30.) £83 6s. 7d. April 27.

### London Gazette, &c.

#### Winding Up Petition

BRITISH ACETATE SILK CORPORATION, LTD. (W.U.P., 31/5/30.) A petition for winding up has been presented by Johnson and Phillips, Ltd., Columbia House, Aldwych, London, W.C.2, and is to be heard at the Royal Courts of Justice, Strand, London, on June 2.

### New Company Registered

SOUTH WALES COLOUR AND CHEMICAL CO., LTD.—Registered May 22. Nominal capital, £1,000 in £1 shares. To carry on the business of manufacturers, importers and exporters of and dealers in red oxide of iron, colours, paints, varnishes, lacquers, transparent or pigmented cellulose products and solvents, chemical manufacturers, etc. Directors: B. H. Phillips, Frondeg Terrace, Llanelly, and G. Lewis.

## Government and the Dyestuffs Act

### Further Questions in the Commons

THERE was further reference to the Dyestuffs Act in the House of Commons on Tuesday when Major Wood asked the President of the Board of Trade if he was aware that the German and English dyestuffs combines, I.G. Farbenindustrie A.G. and Imperial Chemical Industries, Ltd., were co-operating, and in some instances agreeing to the allocation of markets; and whether, in view of this fact, the Government intended to renew the Dyestuffs (Import Regulation) Act?

Mr. W. Graham replied that he understood that agreements regarding nitrogen fertilisers had been made by the companies referred to and others, but with regard to the Dyestuffs Act he had nothing to add to his reply to a question on May 13 (that the policy of the Government was still under consideration, but it was hoped to make an early statement).

Major Wood: Does not the right hon. gentleman think that those agreements defeat the whole purpose of this Act?

Mr. Graham: I have already indicated, in reply to numerous questions, that these facts and many others are precisely the material we must keep before us in arriving at a decision. As soon as a decision has been reached, it will be communicated to the House.

Sir N. Grattan-Doyle: Is not rationalisation the policy of the Government, and is not this an example of rationalisation?

Mr. Graham: That may be so, but the Dyestuffs Act raises a question of large policy concerning import prohibitions which has to be considered.

### German Guests of Glass Technologists

MEMBERS of the Deutsche Glastechnische Gesellschaft arrived in Sheffield on Monday as guests of the Society of Glass Technology. The German visitors were entertained to lunch, and were received by the Lord Mayor (Alderman C. W. Beardsley), the Master Cutler (Mr. A. K. Wilson), Sir Henry Hadow, and Professor W. E. S. Turner, secretary of the Society.

